the OIL AND GAS JOURNAL

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Reed ROLLER BIT COMPANY
HOUSTON 1, TEXAS

PRICE 50 CENTS TABLE OF CONTENTS PAGE 35 JULY 21, 1949

HALLIBURTON
★ 25th
ANNIVERSARY
Our feeling, as we complete a quarter-century of service, is one of deep-felt appreciation. We are grateful for loyal employees, for exceptional opportunities and for the confidence and good will of the industry we serve. It is the confidence of our customers that made possible our growth, their good will that inspires our plans and guides our policies . . .

LOW COST PER UNIT OF WORK

Suppose you're considering two competitive brands of wire rope. They look alike, but one sells for a little less than the other. Bargain? Often it's anything but a bargain. For purchase price alone isn't the measure of wire-rope economy.

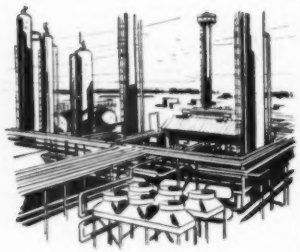
Sometimes you may find a wire rope with a lower price tag than Bethlehem's. But how does the cheaper one compare in total service rendered? How about its *Cost per Unit of Work?*

What a unit of work is depends, of course, upon the industry involved. It can be a ton of rock moved by a power shovel. Or a car of coal hauled up a slope. Or a ton-mile in oil-country rotary drilling. But in any case, unless your final rope Cost per Unit of Work is *low*, the rope has not done an economical job for you. That's why first cost—purchase price—isn't the sole yardstick.

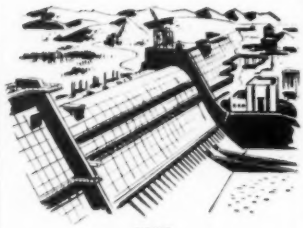
Bethlehem wire rope is a quality product, one conscientiously built for long-range economy. When you buy it, you are spending your money wisely. You are buying wire rope that means, in the truest sense, *low* Cost per Unit of Work.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

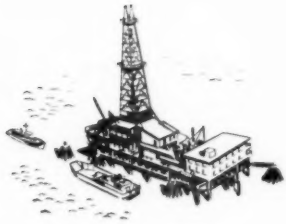
Export Distributor: Bethlehem Steel Export Corporation



GASOLINE PLANTS



DAMS

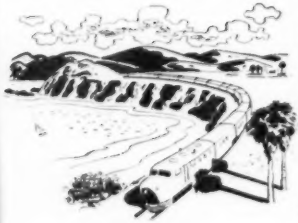


OFFSHORE PLATFORMS

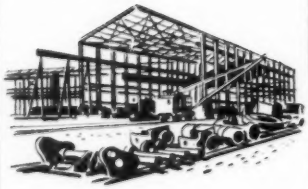
BRIDGES

YOUR PROBLEM IS OUR PLEASURE

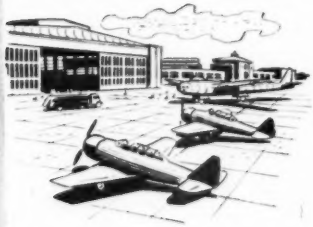
HIGHWAYS



RAILROADS



CHEMICAL PLANTS



MILITARY INSTALLATIONS

Brown & Root, Inc., prides itself on an organization that has met and vanquished the problems surrounding nearly every type of heavy construction. Experience is a stern but thorough teacher, and discoveries made on one project save other clients much time and many dollars.

As long as there is progress there will be new problems, but most of them will be first cousins to the old ones we learned about the hard way.

Tell us your troubles. We may have the solution already worked out.

BROWN-BILT

BROWN & ROOT, Inc. *Engineers & Constructors*

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Associate Companies:— BROWN ENGINEERING CORP. • BROWN & ROOT MARINE OPERATORS INC.

You get MORE CAPACITY with a FANMIX BURNER

Increase Boiler Ratings On Present Or Planned Equipment

In all types of Coppus-Dennis FANMIX Burners — straight gas or combination gas-oil — we utilize the energy of the fuel under pressure to drive the burner fan and deliver air in the proper proportion to the fuel flow. This exclusive "pinwheel action" *mechanically* mixes fuel and air in exactly the right proportions for truly radiant, non-luminous heat.

The result is uniform temperature everywhere in the combustion chamber — no drifting "hot spots" — and complete combustion under all conditions. That's why you can release more heat into your present furnace — why in new installations you get more heat into smaller furnace space.

FANMIX Saves On Both Old and New Installations

FANMIX can easily be operated with your present furnace and stack, requiring only minor changes in other equipment. Or if you're planning on new boilers, remember that FANMIX relieves the furnace from the burden of mixing, creates its own forced draft and takes smaller pipe sizes. Which means you can plan on reduced combustion space, less stack, no forced draft equipment and lower installation costs all around.

Get the Whole Story

Coppus engineers FANMIX Burners to meet individual requirements, providing complete control over heat pattern and combustion . . . Learn more about how "pinwheel action" can step up *your* boiler performance to peak efficiency and economy — as it is doing throughout industry. Send for Bulletin 410-6. Coppus Engineering Corp., Worcester 2, Mass. Sales Offices in THOMAS' REGISTER. Other Coppus "Blue Ribbon" Products in BEST'S SAFETY DIRECTORY, CHEMICAL ENGINEERING CATALOG, REFINERY CATALOG, and MINING CATALOGS.

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VESSEL DIVISION

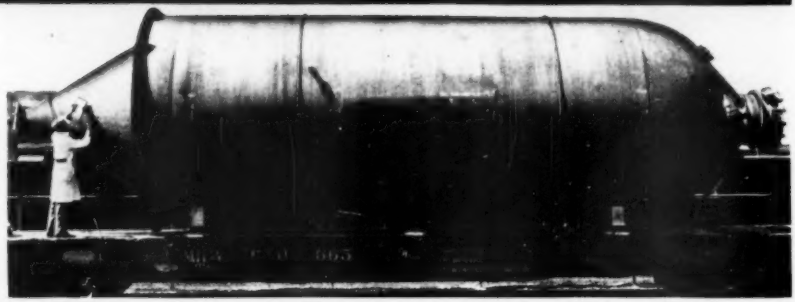
NEWS

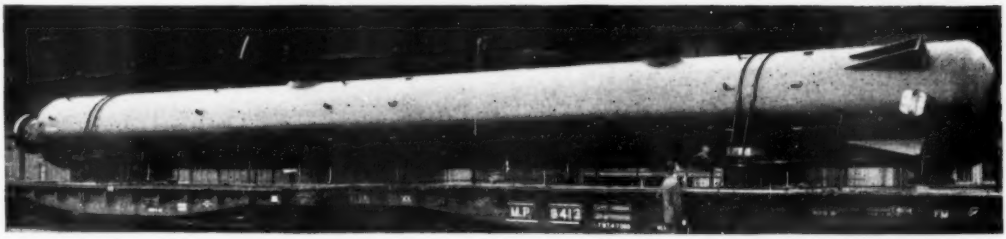
SMITHway 75th ANNIVERSARY 1888 1963

A. O. SMITH corporation

New York 17 • Philadelphia 3 • Pittsburgh 19 • Atlanta 3 • Chicago 4
Tulsa 3 • Dallas 1 • Houston 2 • Seattle 1 • Los Angeles 14
International Division: Milwaukee 1

VESSEL LIFE INSURANCE. Before this SMITH-lined Paper Mill Digester was manufactured, an extensive and comprehensive testing program was completed to be sure the proper alloy lining was selected for the corrosive service. An experimental digester was built and a great many "cooks" were run before the final decision was made.





USING SMITHway MULTI-LAYER CONSTRUCTION WAS MORE ECONOMICAL than single-plate construction in the manufacture of this 72 in. dia. by 80 ft. long water scrubber, at the same time providing a safer construction.

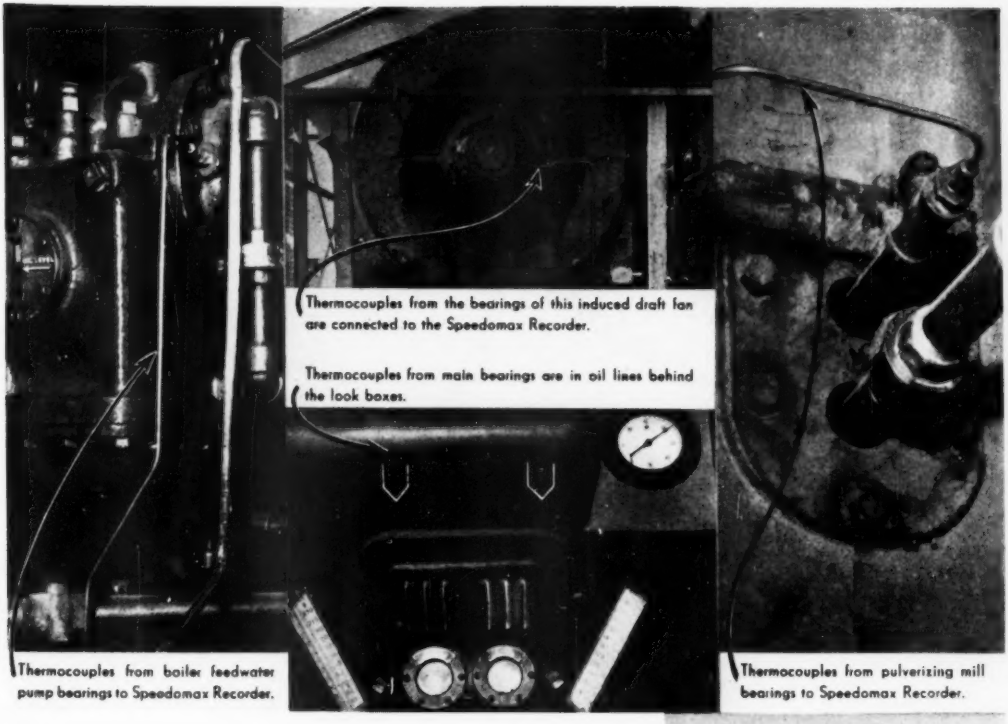
CONSISTENT QUALITY OF SMITHway ELECTRODES used in the manufacture of SMITHway Pressure Vessels is preserved by meticulous control procedures. By means of this X-ray diffraction machine, all raw materials used in electrode coating are checked for the presence of any foreign materials or impurities.

FIELD ASSEMBLY COSTS CUT TO A MINIMUM. The SMITHway is to do the maximum amount of work possible in the shop on vessels too big to be shipped in one piece. All the shell courses on this 15 ft. dia. by 113 ft. long SMITHway Atmospheric Tower were tacked together in the shop to get more accurate and complete installation of the internals.

SEND FOR THESE NEW BULLETINS

Write the nearest A. O. Smith office (see list at top of page) for these newest Vessel Bulletins:

- **FIELD ASSEMBLY OF PRESSURE VESSELS**—Bulletin V-44.
- **SMITHway VESSELS** — Alloy, Alloy-lined, Clad, and Glass-lined —Bulletin V-46.



Thermocouples from the bearings of this induced draft fan are connected to the Speedomax Recorder.

Thermocouples from main bearings are in oil lines behind the look boxes.

Thermocouples from boiler feedwater pump bearings to Speedomax Recorder.

Thermocouples from pulverizing mill bearings to Speedomax Recorder.

Temperature From These 4 Points

. . . And 156 More . . .

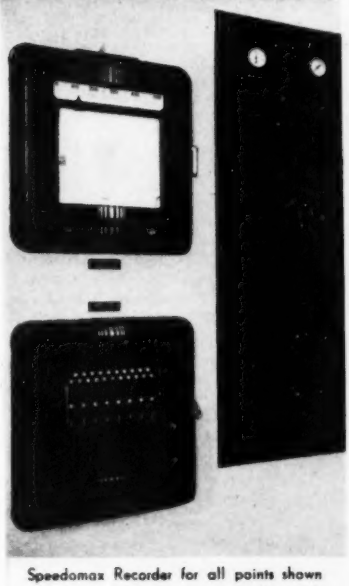
At ONE Speedomax Recorder

Remarkably fast, this new Speedomax offers a definite advance in temperature checking and recording. With Speedomax, an operator can "tour" the temperatures of 160 points in a little less than eleven minutes. He can watch readings as they are automatically indicated; or Speedomax will record them for later examination and for the shift log.

Readings are supplied in such rapid rotation, that it is generally possible to spot any high or low temperature as soon as it develops. In addition, greater operating efficiency is obtained because of the centralization of instrument readings.

The installation procedure is entirely standard. The company's staff simply installs thermocouples at those points from which they desire temperature readings. Couples are connected to the Speedomax equipment in banks of 20 each, with as many as eight banks. Appropriate alarms may be included.

For further information about this versatile temperature checking equipment, simply write for your copy of Folder ND46-33A(1). Address Leeds & Northrup Co., 4959 Stenton Avenue, Philadelphia 44, Penna.



Speedomax Recorder for all points shown and enough more to record a total of 160.

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Now we are welding up to 3" aluminum, using original equipment, of new designs, for butt welding by the Argon-shielded tungsten-arc process. The results have been phenomenal. During the past year we have completed many orders for a wide variety of vessels and exchangers fabricated by this method—from Alloy 38 aluminum—for service at temperatures as low as minus 320° F.

Our complete facilities are available to you—for the fabrication of a single item or large quantities, either direct or on a contract basis. Using many originally developed methods and equipment, we offer production capacity for the brazing, welding, tube-rolling and x-raying of aluminum in standard or thick sections. May we show you how aluminum will improve the durability of your process equipment—and reduce your replacement and maintenance costs?

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One of the Dresser Industries
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● Write for your copy of this interesting new bulletin, explaining our facilities and illustrating our experience in the field of aluminum fabrication. Ask for Bulletin A-48.

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ONE SOURCE OF SUPPLY
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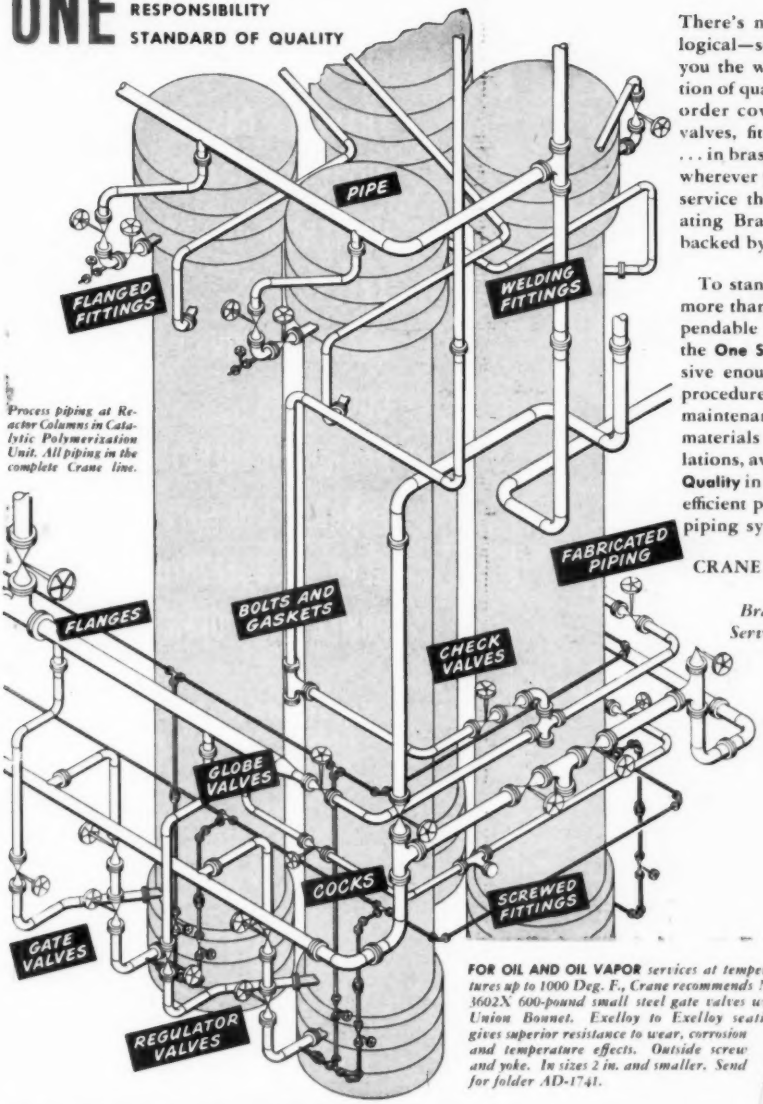

Process piping at Reactor Columns in Catalytic Polymerization Unit. All piping in the complete Crane line.

There's no more advantageous—or logical—source to rely on. Crane offers you the world's most complete selection of quality piping equipment. One order covers whatever you need—valves, fittings, pipe and accessories . . . in brass, iron, steel and alloys. And wherever you are, you're sure of better service through well-stocked cooperating Branches and Wholesalers . . . backed by large factory stocks.

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TOLEDO 1, OHIO, U.S.A.

The MURPHY DIESEL

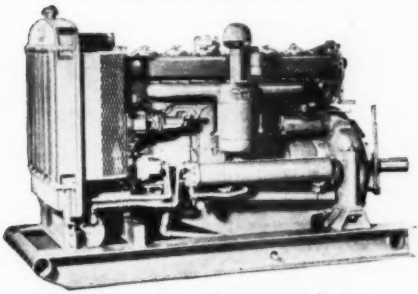
is built for heavy-duty, continuous service!

the Murphy Unit Injector

. . . heart of the MURPHY DIESEL

A simple dependable unit injector for each cylinder serves as both pump and nozzle and eliminates all high pressure fuel lines.

Above, right—Two 150 H. P. continuous, 180 H. P. intermittent, Murphy Diesels power this mud pump. Three other Murphy Diesels are used to power the draw works.



Murphy Heavy Duty "True" Diesel Engines and Power Units 90 to 220 H.P.

Generator Sets 60 to 133 K.W., A.C. or D.C.

it's a "True" diesel

By utilizing maximum power in the fuel, the "true" diesel operating principle—solid fuel injected directly into a plain open combustion chamber—makes it possible for the Murphy Diesel to deliver more heavy-duty power, continuously. The absence of pre-combustion and pre-mixing chambers reduces turbulence within the cylinder, conserving the heat of compression for immediate ignition and controlling temperatures of pistons, valves and cylinder liners to reduce wear.

Such features as unit fuel injection . . . four valves per cylinder . . . flywheel end cam drive . . . oil cooled pistons . . . and through tie bolts further insure Murphy Diesels' ability to fulfill the toughest sustained heavy-duty power requirements.

Have your Murphy Diesel Dealer give you all the facts today—and ask him for a copy of the booklet "7 Questions to Ask a Diesel Engine Salesman".

MURPHY DIESEL COMPANY

5305 West Burnham Street Milwaukee 14, Wisconsin

MURPHY DIESEL

LOWEST ULTIMATE POWER COST

FACTORY BRANCH—SALES, PARTS and SERVICE

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Industrial EXPERIENCE

As manufacturers of hundreds of steel tanks and other allied products since 1908, the Chattanooga Boiler and Tank Company has accumulated a wealth of industrial application experience.

Our services consist of designing, fabricating and erecting storage and dry-materials handling equipment for chemical and processing industries.

Whether you need pressure vessels, gravity bins, hoppers, kettles, pans or pipe, the skilled workmanship and efficient production supervision associated with Southland Steel Products, assure you dependable operation and economical maintenance.

CHATTANOOGA BOILER and TANK CO.

Chattanooga, Tenn.

OVER 40 YEARS OF SERVICE

STEEL SOUTHLAND PRODUCTS

TO AMERICAN INDUSTRY

NOW IT'S HERE...*the New "VAREC" Electronic Gauger!*

COSTS YOU LESS

Initial costs are lower because the new electronic design eliminates Selsyn Motors. Installation costs are less because fewer and smaller wires are used.

GIVES YOU GREATER ACCURACY

Accuracy is only limited by types of float gauge used. Measures liquid level to ± 1/16" with "VAREC" 253 Series Automatic Tank Gauges. Not affected by wide line voltage variations.

PROMOTES SAFETY

No climbing on slippery tanks during wet or icy weather. No danger from toxic vapors. Low voltage, low current transmitter completely isolated from tank vapors.

EASY TO OPERATE AND MAINTAIN

You need only select the tank to obtain an accurate continuous gauge reading. You need only push a button to instantaneously check receiver adjustments. It is not necessary to reset instrument after power failure.

GREATER VERSATILITY

Transmitters may be installed on tanks already equipped with suitable float-type gauges. Small, compact receiver may be located on desk or panel mounted. Readings may be made at more than one remote position by installing additional receivers. High-low level alarms or controls may be added to the receiver without running additional wires to the tanks.

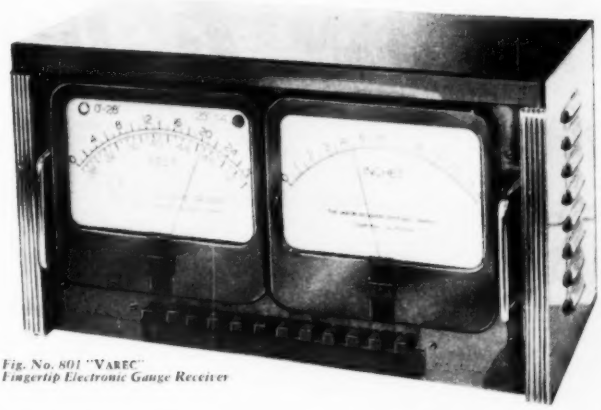

Fig. No. 801 "VAREC" Fingertip Electronic Gauge Receiver

REMOTE LIQUID LEVEL GAUGING AT ITS BEST!

Now you can gauge your tanks accurately to within ± 1/16" of tank level on a centrally located panel. The new "VAREC" Electronic Gauges enable you to duplicate tank gauge readings at any location... gives you greater accuracy when installed with "VAREC" Automatic Tank Gauges. Eliminates traveling throughout the tank farm or gauging tanks outside during bad weather. Eliminates the dangers of toxic vapors. Eliminates the errors from the human element in gauging.

MULTIPLE OR SINGLE TANK RECEIVERS

Multiple Tank Receivers, for individual gauging up to 10 tanks or up to 24 tanks; On-Gauge Receivers for individual tanks or simultaneous gauging. The front panel of each receiver has two dials. Feet indications from 0 to 54 feet are read on the left-hand dial and inch indications from 0 to 12 inches by 1/8" increments are read on the right-hand dial. Proper reading of the foot scale is designated by two colored pilot lights at the upper corners of the dial. The receivers are designed for use on 110-115 volt, 50-60 cycle, a-c power.

EXPLOSION-PROOF TRANSMITTERS

Transmitters are available in four designs to meet tank working pressure requirements. All are designed to be explosion-proof, suitable for use in Class 1, Group D, hazardous locations.

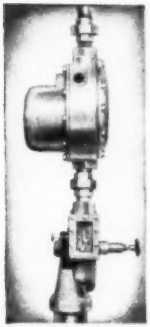

Fig. No. 850 Electronic Gauger Transmitter installed above lookbox of "VAREC" Fig. No. 253 Automatic Tank Gauge.

PROVED — APPROVED

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THE VAPOR RECOVERY SYSTEMS COMPANY

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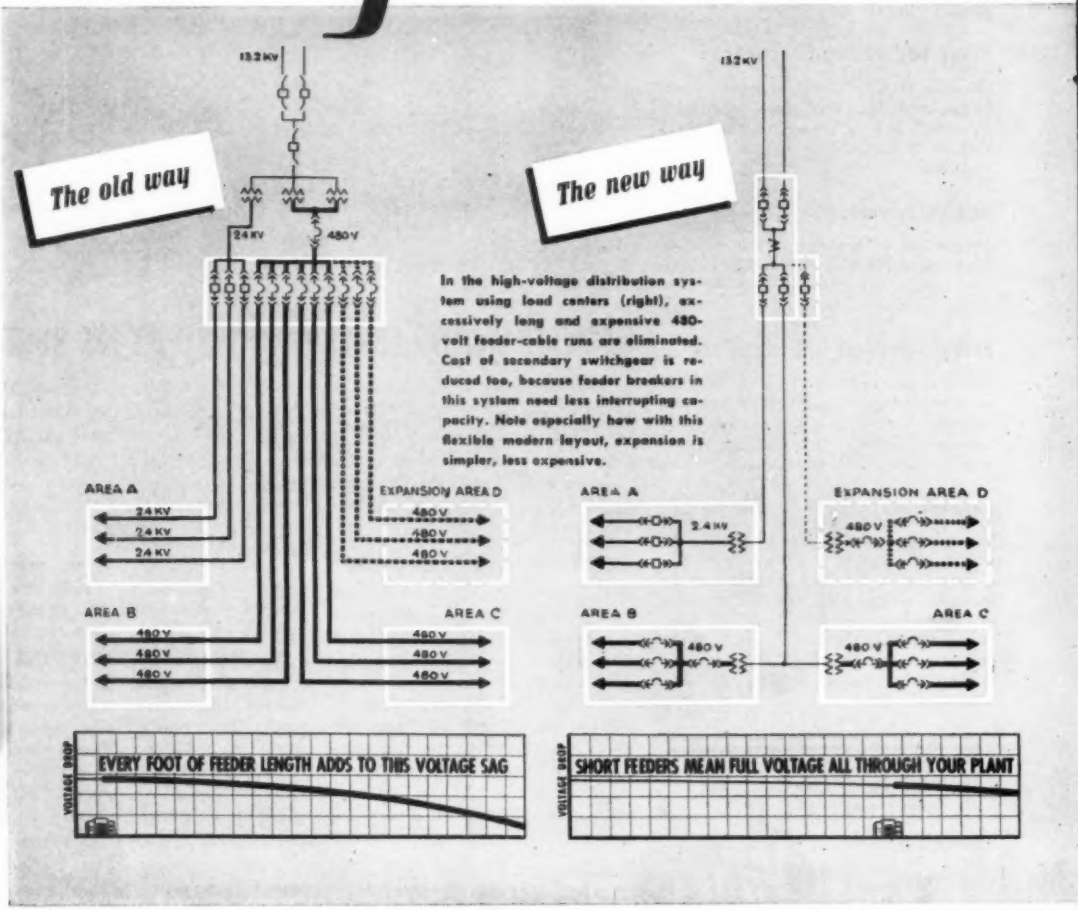
Send for Your Copy of "Remote Gauging at Its Best" Today!

SEE THE "VAREC" ELECTRONIC GAUGER AT THE I.S.A. INSTRUMENT EXHIBIT IN ST. LOUIS SEPTEMBER 12-16

What's the trend in refinery electrification? } more high-


The old way
The new way
13.2 KV
24 KV
480 V
In the high-voltage distribution system using load centers (right), excessively long and expensive 480-volt feeder-cable runs are eliminated. Cost of secondary switchgear is reduced too, because feeder breakers in this system need less interrupting capacity. Note especially how with this flexible modern layout, expansion is simpler, less expensive.
AREA A
EXPANSION AREA D
AREA B
AREA C
VOLTAGE DROP
EVERY FOOT OF FEEDER LENGTH ADDS TO THIS VOLTAGE SAG
SHORT FEEDERS MEAN FULL VOLTAGE ALL THROUGH YOUR PLANT

Here's what you need to modernize your power system! }

WHEN YOU COME TO GENERAL ELECTRIC you get far more than the finest in electrical equipment. A General Electric application engineer, familiar with refinery practices, is at your disposal. If desired, he stands ready to take over the job of co-ordinating all the needed components, engineering your power distribution into one modern, efficient system.

voltage distribution

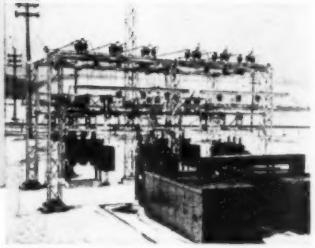
to reduce power losses, cut equipment costs

You see it in more and more refineries today. It's the trend to load-center power distribution. High-voltage power is distributed within the plant right to the heart of electrical load areas. There it's stepped down to utilization levels in load-center unit substations and carried to points of use by *short* low-voltage secondary feeders.

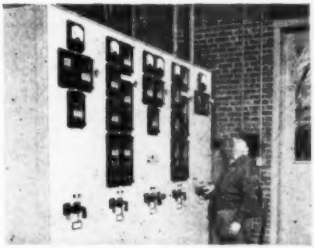
This modern method provides several advantages. By replacing long, low-voltage feeders with short ones, voltage fluctuation is kept within narrow limits, and voltage drop is lessened. This cuts power losses, permits plant equipment to run at full efficiency.

Economies in the cost of cable runs, as well as in the cost of transformers and secondary switchgear, go hand in hand with high-voltage distribution. Plant rearrangements or additions can be made at less cost because of the flexibility of this system. Lower maintenance costs and easier installation are added advantages.

THREE KINDS OF HELP . . . NO OBLIGATION! It's a simple matter for you to get the whole story on how modern refinery power distribution can affect your plant layout, operating continuity, costs. As a service to industry, General Electric offers a 3-point program comprising (1) A fact-filled manual, without sales talk, on plant power distribution; (2) A slidefilm with sound that shows in detail what load-center distribution is and what it does; (3) Illustrated booklets highlighting the main points of manual and film. Write today to have this helpful program made available to you and your staff—without charge or obligation. ***Apparatus Dept., General Electric Company, Schenectady 5, N. Y.***



These completely metal-enclosed G-E package substations are factory-built to fully co-ordinated designs. You save both engineering time and installation time.



In G-E metal-clad switchgear, convenient vertical-lift construction of magne-blast air circuit breakers makes it a quick, easy job to remove them for inspection or maintenance.

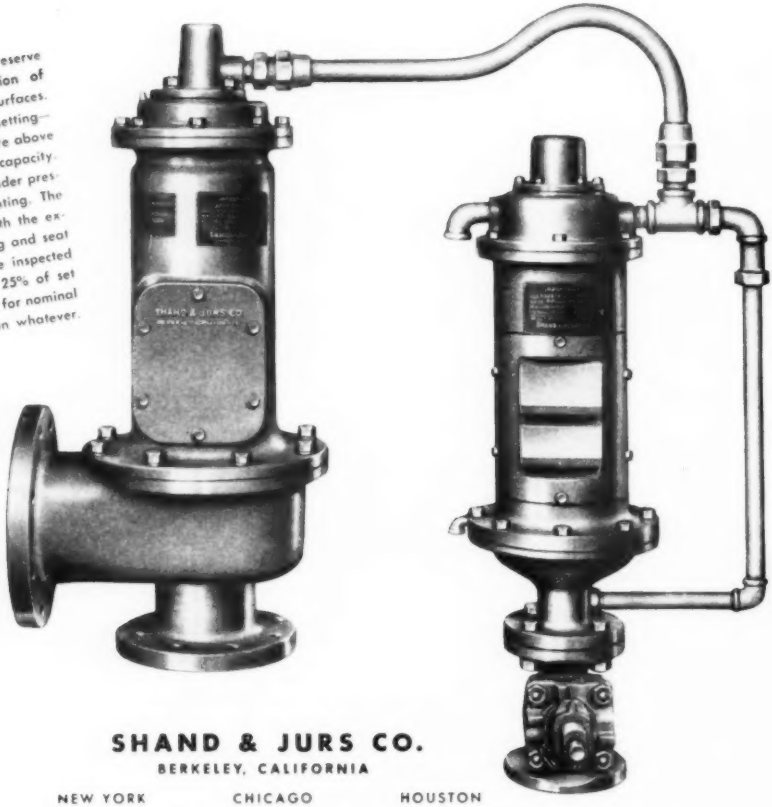
Load-center unit substations—compact, fully enclosed, and built from matched components—are complete, easy-to-specify units. Made in flexible combinations, easy to rearrange.

GENERAL ELECTRIC

PREVENTS *Rupture* OF PRESSURE TANKS

As storage pressures increase, property damage and personnel hazards also increase, and extra care is warranted in assuring that high pressure tanks are not ruptured by excessive internal pressures. To provide a positive method of protecting tankage against overpressure, we present our patented Pilot Operated Safety Valve, Model ST-2500, which incorporates numerous features not found in any other safety relief valve. This valve is available in 2", 4" and 6" sizes and is applicable to tanks operating at pressures above 10 pounds.

This valve incorporates a great reserve force for breaking ice or adhesion of gummy substances on the seating surfaces. It operates at the exact pressure setting—there is no accumulation of pressure above the set pressure required for full capacity. The main valve pallet is seated under pressure to the very instant of venting. The blowdown is at a minimum. With the exception of the main valve spring and seat proper, the entire valve can be inspected with a loss of not more than 25% of set pressure. It has a high capacity for nominal size and requires no lubrication whatever.



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Materials and Application Procedure for:

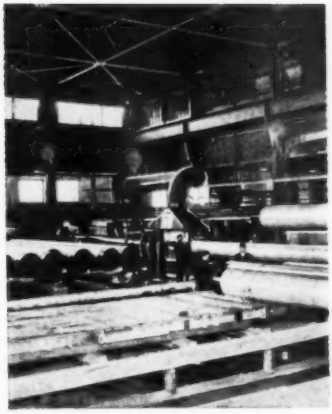
1. **Water Industries**
2. **Natural Gas, Crude Oils and Products Transmission**
3. **Professional Application in Plants and Yards**
4. **Distribution Systems**
5. **Reconditioning Operations**
6. **Gathering Systems**
7. **Recycling Operations**

Supervision — PROFESSIONAL APPLICATION OF PIPE COATINGS IN PLANTS AND YARDS

In recent years, there has been increasing recognition of the fact that *proper application* of pipe coatings is a primary requirement of corrosion-proof lines.

This has resulted in an increasing trend towards *professional* coating application in plants and yards where pipe can be delivered and processed under controlled conditions.

Services include: (1) Storing of pipe as received from mill until owner orders it coated and shipped. (2) Indoor application at plants under controlled weather conditions. (3) Warming and drying of pipe before primer application. (4) Cleaning of metal by grit-blasting before priming, followed by drying in ovens. (5) Immediate enamel-coating and wrapping, in thickness and number of coats specified by engineer. (6) Electrical inspection of coating, and repairs if necessary. (7) Protection of coated pipe in transit.



Barrett now offers an expert supervision service in connection with application plants and yards. Owners wishing to avail themselves of the advantages of professional application can have the work done with Barrett materials and under Barrett supervision. We will be glad to supply further information upon request.

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

Barrett*

*Reg. U. S. Pat. Off.

it DIGS...it LOADS at tremendous savings

Whether you need it for excavation work or loading from stockpiles or both, you need the new low production cost of the Dempster-Diggster. Here is the only small shovel that works on a hydraulic, simultaneous or independent crowd and hoist action and completely eliminates tractive effort in loading with wheels. Its variable crowd action at any dipper position means the Dempster-Diggster can dig lower . . . 15 inches below grade. Exclusive hoisting action means it can dig higher . . . digs out a 15 ft. bank. It's the only small shovel featuring such speed and mobility . . . travels at truck speeds on the road . . . gets in tight places on big jobs, freeing large shovels for heavier work. Ideal for the small and medium size excavation jobs yet powerful and fast enough for big jobs.

Stockpiling or loading work is easy for the DEMPSTER-DIGGSTER. Its speed . . . its 15 ft. turning radius . . . its extraordinary dumping reach help the Dempster-Diggster complete the average loading job in an amazingly short time. Dempster-Diggster buckets are easily interchangeable and are available in three sizes. 1 cu. yd. (heaped) with hardened steel teeth for digging . . . 1½ and 2 cu. yd. for loading and stockpiling work. Power is supplied by a heavy duty gasoline or diesel engine. Hoisting, crowding, steering and braking are all 100% hydraulic. For complete information, write today for Folder Number 8154.

Large photo above shows Dempster-Diggster loading crushed stone. Note how independent crowd and hoist action permits bucket to follow the slope of the material. At right, top: Digging out high bank. Right, center: Closeup of 1 cu. yd. (heaped) digging bucket. Right, bottom: Dumping crushed stone into truck.

DEMPSTER BROTHERS INC.

579 Dempster Bldg., Knoxville 17, Tennessee

on Allegheny Metal Plates

For certified data on individual grades of Stainless Steel, use

ALLEGHENY LUDLUM BLUE SHEETS

There is a Blue Sheet for each individual grade of Allegheny Metal, giving full information on its physical and chemical properties and characteristics. Let us send you this certified, laboratory-proved data on the stainless grades in which you are interested.

ADDRESS

DEPT. O-77

For any job you may have which involves the handling of large volumes, heat and high pressures—either singly or all at one time—you can get Allegheny Metal solid or clad plates in the exact stainless grade you need to combat corrosion, oxidation and contamination.

Some of these grades are *new* . . . comparatively recent developments of our research and experience as a pioneer and leader in stainless steel production. Others are improved versions of older analyses. The latest information on the entire subject of stainless plates is available to you in the booklet illustrated above—32 pages of valuable data on types, sizes, finishes, fabricating methods and uses, including ASTM and ASME boiler codes.

Specify "Allegheny Metal" for complete reliability in stainless steel plates, and write for your copy of the A-L Plate Book.

ALLEGHENY LUDLUM STEEL CORPORATION
Pittsburgh, Pa.

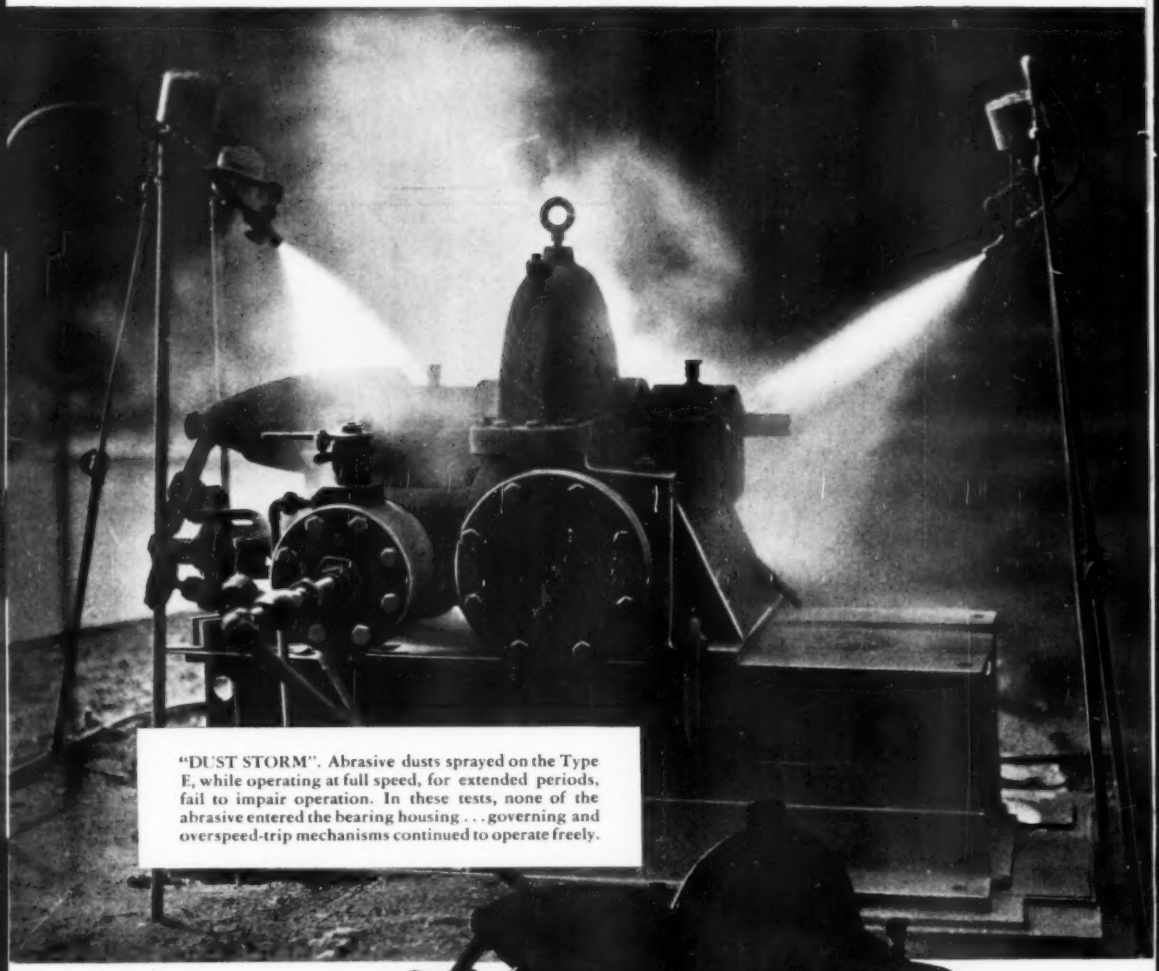
Nation's Leading Producer of Stainless Steels in All Forms

W&D 2566

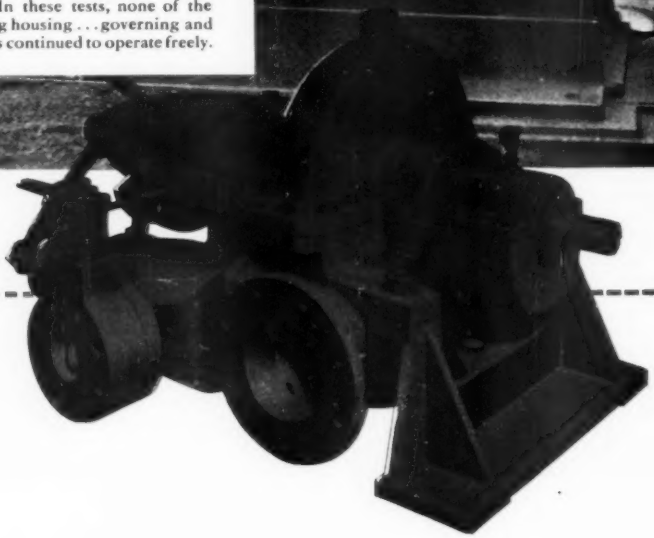
ALLEGHENY METAL is stocked by all Joseph T. Ryerson & Son, Inc. warehouses

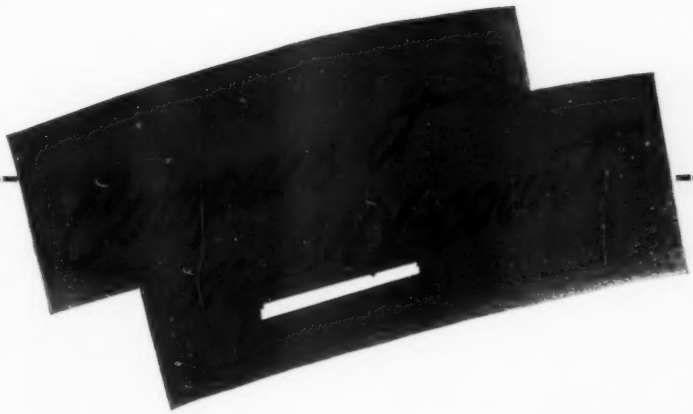
YOU CAN BE **SURE**.. IF IT'S

Westinghouse



"DUST STORM". Abrasive dusts sprayed on the Type E, while operating at full speed, for extended periods, fail to impair operation. In these tests, none of the abrasive entered the bearing housing . . . governing and overspeed-trip mechanisms continued to operate freely.





Defies dust and dirt

The Type E Turbine is built for tough service. You can depend on this new general-purpose steam drive for the kind of service you want . . . *whenever* and *wherever* you want it. Whether you use the Type E for continuous or stand-by duty, you'll get smooth, reliable power.

Prolonged exposure to abrasive dusts or accumulations of sludge fails to more than dirty up the outside casing. Bearing seals are positive . . . keep oil in and filth out. No foreign matter can enter bearings or cylinder. There are no close-sliding fits to become jammed. Corrosion is avoided by liberal use of corrosion- and erosion-resisting materials throughout interior and exterior mechanisms. The governor-control linkage is always free to move, even when heavily covered with dust and dirt.

Exposure protection is but one of the important features of Type E Turbines. Wrapped up in one *standard* unit are the best features of previous Westinghouse mechanical drives, plus refinements and new developments that add up to greater economy and dependability. Sizes are available from 5 to 1,500 hp.

We invite your comparison . . . on *any* count. Get the facts from your nearby Westinghouse office, or write for 20-page booklet B-3896. Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.

J-50500

Westinghouse

TYPE E

Turbines

WESTINGHOUSE

Millions

of KAYDON *precision needle rollers

*Tolerance on diameter .0002". On the Inspection Board shown above are KAYDON Needle Rollers .1250" diameter.

The success of KAYDON Precision NEEDLE ROLLERS in automobile and truck transmissions, universal joints, clutches, steering gears and other products, has led to their use in practically all types of machinery.

Since these needle rollers may be used between hardened shafts and hardened bores of housings or gears, they eliminate the need for bearing races. Thus they provide the most compact high-capacity anti-friction bearing possible, requiring little or no more space than so-called plain or "solid" bearings.

Millions of these precision needle rollers are being made in standard sizes, ⅛" to ⅝" diameters (tolerance .0002" on diameter), flat or rounded ends. Other sizes are being added as "standard" when quantities warrant.

By using standard sizes that are now in big volume production, you get the benefit of low cost for highest performance-proved quality in small or large quantities . . . but regardless of whether your machine design permits use of standard sizes or demands special needle rollers, contact KAYDON.

Be sure to state sizes and quantities when you send your inquiries.

Capacity also available now for all types and sizes of KAYDON Standard or Special Bearings. It pays to "contact KAYDON of Muskegon."

KAYDON *Types of Standard or Special Bearings:*
Spherical Roller • Taper Roller • Ball Radial
Ball Thrust • Roller Radial • Roller Thrust

THE KAYDON ENGINEERING CORP., MUSKEGON, MICH.

All types of Ball and Roller Bearings 4" bore to 120" outside diameter

IMPROVE YOUR PRODUCTION . . .

AVOID MECHANICAL SHUTDOWNS!

MINNEAPOLIS-MOLINE

MODERN MACHINERY

POWER UNITS

SUPPLY DEPENDABLE, LOW COST POWER

The surest way to maintain steady high-level production is through dependable uninterrupted power. Minneapolis-Moline engines for oil field power have built an enviable record for continuous duty without mechanical shutdowns.

Low cost installations of MM heavy-duty engines that provide 25 to 230 h. p. offer exceptional maintenance economy and long engine life. In addition you get these MM exclusive features: *crankcase ventilation, heat exchanger base pans, high-turbulence combustion chambers, regulated cooling, by-pass thermostats, removable cylinder heads and blocks, extra large bearing surfaces, replaceable bearing shells that are steel-backed and precision made, water-cooled manifolds,* and many others.

You, too, will agree that Minneapolis-Moline engines are quality constructed and skillfully engineered for heavy-duty performance in oil field operations.

DISTRIBUTED BY . . .

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MINNEAPOLIS-MOLINE

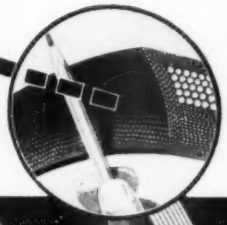
MINNEAPOLIS 1, MINNESOTA

This Simple Test
Shows Exactly How

The CONCAVE SIDE...

(U.S. Patent No. 1813698)

Saves You Money!



Pick up *any* V-belt having the ordinary straight sides and *bend* the belt. Three things will happen, right before your eyes.

(1) The top of the belt is under tension and grows *narrower.* (2) The body, under compression, becomes wider. (3) The sides of the belt *bulge out.* (Figures 1 and 1-A, below.)

Straight-Sided V-Belt

How Straight-Sided V-Belt Bulges in Sheave-Groove

This bulging of the straight-sided V-belt in its sheave-groove costs you money in *two* ways—(1) The bulge causes uneven sidewall wear—*shorter life!* (2) The bulging side cannot evenly grip the wall of the sheave groove—a loss in *transmission efficiency!*

In figures 2 and 2-A, you see how the precisely engineered *concave* side of the Gates Vulco Rope exactly corrects this bulging.

Gates Vulco Rope with Concave Side.

No Side Bulge. Precise Fit in Sheave-Groove.

Two distinct *savings* result. (1) The Gates Vulco Rope wears evenly—*longer life!* (2) The entire side-wall grips the pulley—carries heavier loads and *sudden load increases* without slippage:—saves *belts* and also *saves power!*

The Mark of SPECIALIZED Research

The Concave Side is *MORE IMPORTANT NOW* Than Ever Before

Because the sides of a V-Belt are what actually drive the pulley, it is clear that any increased load on the belt means a heavier load that must be transmitted to the pulley directly through the belt's sidewalls.

Now that Gates *SPECIALIZED* Research has made available to you SUPER Vulco Ropes—carrying fully 40% higher horsepower ratings—the life-prolonging Concave Side is naturally more important in conserving belt life today than ever before.

498

GATES VULCO ROPE DRIVES
IN ALL INDUSTRIAL CENTERS of the U. S. and 71 Foreign Countries
Engineering Offices and Jobber Stocks

THE GATES RUBBER COMPANY
DENVER, U.S.A.
The World's Largest Makers of V-Belts

Roadside Report

FORD Bonus Built TRUCKS ★ **H. J. WILLS** Lafayette, La.

Ford Model F-8 BIG JOB shown, has Gross Combination Weight rating of 39,000 lbs. as a tractor; Gross Vehicle Weight rating of 21,500 lbs.

"Our FORD F-8's use 20% less fuel than other heavier trucks"

"OUR EXPERIENCE with the 145-horsepower Ford F-8 Big Jobs has been so satisfactory we're converting our entire fleet to F-8's," writes H. J. Wills, Secretary-Treasurer of the Prudhomme Oil Co., Lafayette, Louisiana." Our Ford F-8's use 20% less fuel than other heavier trucks . . . and they've got the power to handle the same loads perfectly!"

Gas and Oil truckers like Mr. Wills are going all-out in their praises for the new 145-horsepower Ford Big Jobs. For one thing . . . the new Ford 337 cu. in. engine outperforms anything in its class. For another . . . there's the luxurious comfort of the new Ford Million Dollar Cab—mighty important when your drivers have to operate over long distances on tough roads. And Ford Big Jobs are Bonus Built—a feature of every one of over 150 Ford Truck models. Bonus Built is the superstrong construction that contributes to long truck life. Life insurance experts prove Ford Trucks last longer.

ONLY THE FORD BIG JOB
HAS ALL THESE FEATURES

- ★ New 145-h.p. Ford V-8 engine for top performance.
- ★ Ford exclusive concentric dual-throat carburetor for more power, more economy.
- ★ New heavy duty 5-speed transmissions—overdrive or direct-in-fifth—for operating flexibility.
- ★ Big Ford power-operated hydraulic brakes; front 16-inch by 2¼-inch; rear 15-inch by 5-inch double cylinder on F-7, 16-inch by 5-inch double cylinder on F-8. Air brakes also available for F-8.
- ★ Ford Super Quadrax single speed axles; two-speed axle available in Model F-8.
- ★ Large diameter (10-inch) wheel bolt circle with 8 studs to allow for extra-strong hub construction.
- ★ Million Dollar Cab with Ford Level Action suspension for greater driving comfort.
- ★ Nationwide service from over 6,400 Ford Dealers.
- ★ Ford Bonus Built construction for long truck life.

Gross Vehicle Weight ratings: F-8 up to 21,500 lbs., F-7 up to 19,000 lbs. Gross Combination ratings: F-8 up to 39,000 lbs., F-7 up to 35,000 lbs.

FORD 1949 *Bonus Built* TRUCKS 1959

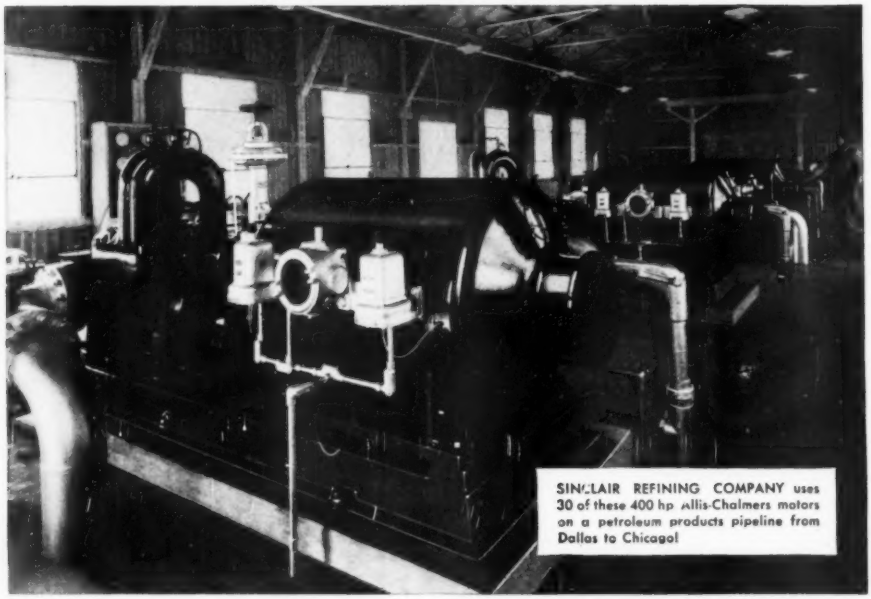
BUILT STRONGER TO LAST LONGER

USING LATEST REGISTRATION DATA ON 6,106,000 TRUCKS, LIFE INSURANCE EXPERTS PROVE FORD TRUCKS LAST LONGER!

Underwriters' Laboratories INSPECTED MOTOR FOR HAZARDOUS LOCATION ELEC 10152 CLASS 1 GROUP D NO L

EXPLOSION-PROOF MOTORS TO 450 HP!

Higher Ratings In Similar Design



SINCLAIR REFINING COMPANY uses 30 of these 400 hp Allis-Chalmers motors on a petroleum products pipeline from Dallas to Chicago!

OVER ONE THIRD of Allis-Chalmers tube-type, explosion-proof motors have been purchased by 18 of the world's leading petroleum companies! . . . Proof that petroleum operators want these important features:

1. APPROVED BY UNDERWRITERS' LABORATORIES for ratings to *450 hp at 3600 rpm.* Motors of similar design are offered in larger sizes. This new, tube-type motor is the simplest explosion-proof design now offered in the very large sizes.

2. MOTOR IS SELF-CLEANING because of straight flow of cooling air — avoiding hidden recesses encountered in usual designs. If unusual operating conditions make cleaning desirable, motors can be cleaned while in operation — simple as cleaning your shotgun with a ramrod!

3. QUIET OPERATION because of improved fan design . . . straight flow of cooling air . . . smaller quantity of cooling air required by effective radiation system.

4. LIGHTER WEIGHT, YET MORE EFFICIENT! Elimination of heavy shell castings reduces motor weight . . . no sacrifice of electrical performance.

You'll want more information on how this *new* motor can help save maintenance dollars! Send for Bulletin 51R7149.

ALLIS-CHALMERS, 1059A SO. 70 ST.
MILWAUKEE, WIS.

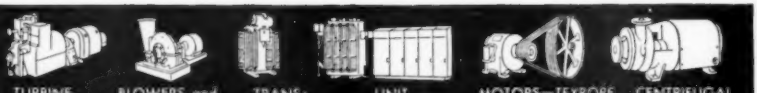
Texrope is an Allis-Chalmers trademark.

AC ALLIS-CHALMERS

ALLIS-CHALMERS

A-2760

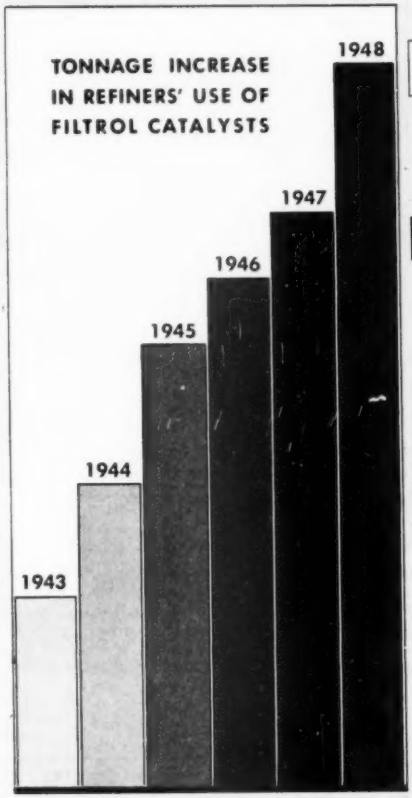
Power, Electrical, Processing Equipment for Petroleum Industry



TURBINE-GENERATORS · BLOWERS and COMPRESSORS · TRANSFORMERS · UNIT SUBSTATIONS · MOTORS—*TEXROPE* DRIVES-CONTROL · CENTRIFUGAL PUMPS

TODAY more petroleum refiners are using Filtrol Catalysts than ever before...

thermofor catalytic cracking
fluid catalytic cracking
and others



More refiners use Filtrol Catalysts each year because—Filtrol Catalysts have proven to be more flexible, to produce quality yields from a wide selection of charging stocks with minimum cost of operation.

Their experienced judgment speaks for FILTROL*

REFINERY EXECUTIVES, production managers and technical staffs responsible for economical refinery balance—the men that actually refine the bulk of America's production—use and specify more Filtrol today than at wartime peak.

• Experienced refiners compare catalysts at their practical optimum plant operation levels—integrated with overall refinery balance—and they continue year after year to specify Filtrol Catalysts.

FILTROL CORPORATION
General Offices:
634 South Spring St., Los Angeles 14, Calif.
Plants: Vernon, Calif. and Jackson, Miss.

Filtrol products are available throughout the world

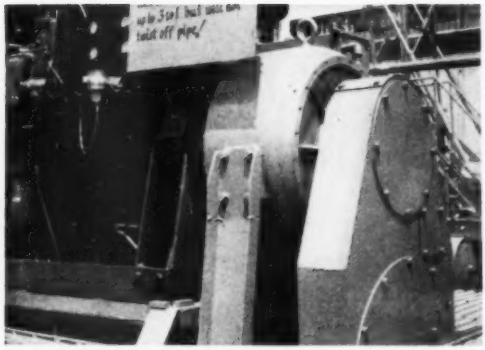
PRODUCT OF **Filtrol***

CATALYSTS • ADSORBENTS • DESICCANTS

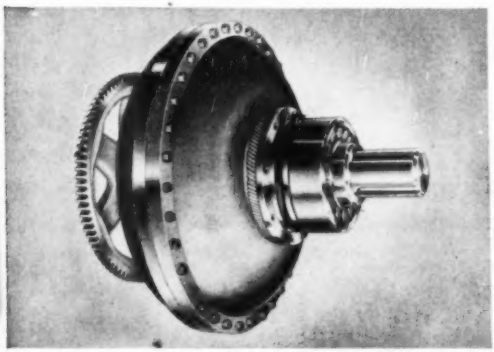
RESEARCH AND DEVELOPMENT

*Reg. U. S. Pat. Off.

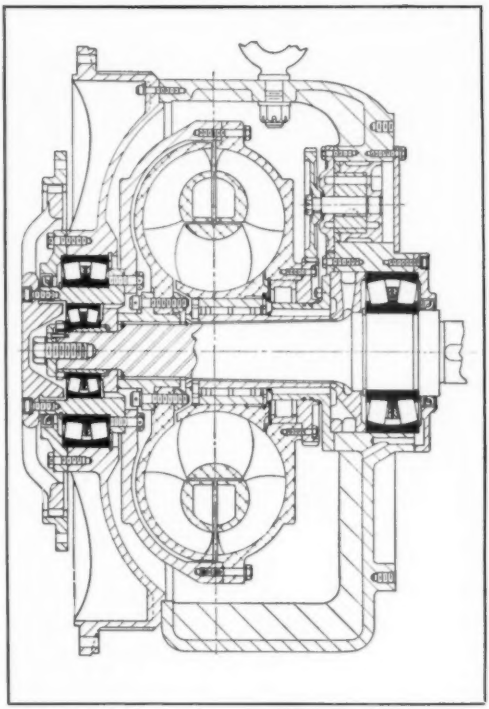
Torrington Spherical Roller Bearings Operate Freely Under Deflection in TORCON Torque Converters



An efficient transmission for a rotary table drive, above, or for other oil field and industrial machinery, the Torcon is a hydraulic torque converter and coupling in one. For smooth, trouble-free operation, it is equipped with Torrington Spherical Roller Bearings.



No detail that might increase the efficiency and reliability of the Torcon (Schneider System) has been omitted by Torcon Corporation, Chagrin Falls, Ohio. That's why high-capacity Spherical Roller Bearings are used on the input and output shafts.



One problem solved by the use of Spherical Roller Bearings is deflection of the output shaft, caused by overhung sprocket loads. The application of self-aligning bearings, shown in cross-section, permits the use of a right angle chain drive, without an outboard bearing. Long service life is assured by the high capacity and smooth operation of Torrington Spherical Roller Bearings.

Design for greater efficiency, longer service life and lower maintenance costs with Torrington Spherical Roller Bearings. Our engineers will be glad to help you. Write us today. THE TORRINGTON COMPANY, South Bend 21, Ind., or Torrington, Conn. District offices and distributors in principal cities of United States and Canada.

TORRINGTON *SPHERICAL ROLLER* **BEARINGS**

Spherical Roller • Tapered Roller • Straight Roller

Needle • Ball • Needle Rollers

3

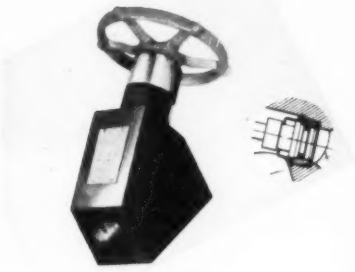
... with GROVE dependability

T SERIES

Metal-to-metal seat valve of unique design and precision manufacture, for gauge lines, meter manifolds and similar services. Seat-Seal design gives positive tight shut-off. Pressure range up to 3000 p.s.i., temperature range −30° to 150° F.

N SERIES

Widely applicable in gauge lines and many other services where small flow passages are acceptable. Available in globe, angle, tri-port and cross-over designs. Maximum operating pressure 6000 p.s.i. at temperatures from −30° to 150° F.



V SERIES

Larger Seat-Seal valves for flow line services, loading racks, etc. Full-floating seat ring aligns itself to the valve. Sealed-in lifetime lubricant. Maximum pressure 2000 p.s.i. at −30° to 150° F.

You'll find Grove quality in these three small valves, too. Adaptable to a wide range of operating needs, they are designed and built to overcome the inherent weaknesses of conventional valves. Series "N" is a needle valve, while Series "T" and "V" incorporate the patented Grove Seat-Seal feature . . . *the greatest development yet perfected in valve design.* All three types operate easily, giving a dead tight seal with ordinary hand pressure—no jamming or forcing. Wrenches are never required.

Series "N" is a small stainless steel needle pointed valve, sealed at stem and bonnet with "O" rings to insure complete freedom from all packing difficulties.

The "T" Series valve, made of stainless steel with a bakelite handwheel, is available in globe, angle, tri-port and cross-over designs. It can also be used to furnish a complete panel.

Series "V," of stainless and carbon steels, is supplied in straight-through or 90° angle patterns. Built to last a lifetime, the "V" valve cannot be harmed by throttling action—cutting and erosion are entirely absorbed by the plug sleeve and replaceable seat ring.

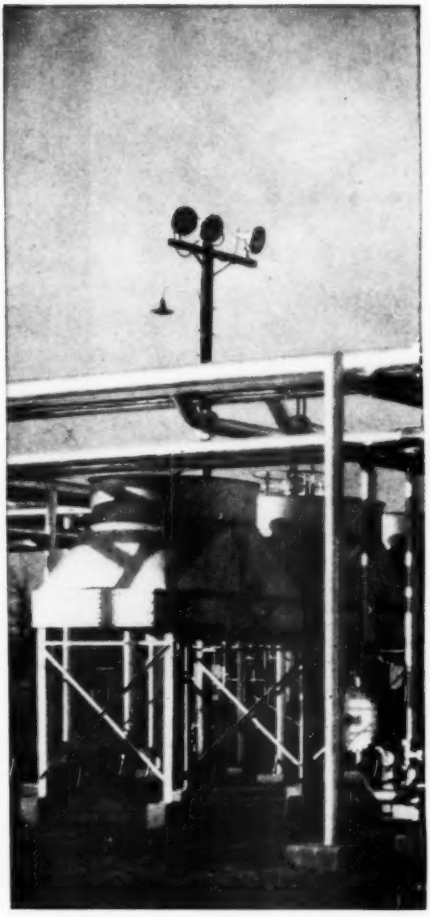
GROVE REGULATOR COMPANY

65th & Hollis Street Oakland 8, Calif.

Factory Branches: 3608 Navigation Blvd., Houston, Texas; 1930 W. Olympic Blvd., Los Angeles 6, Calif.

GROVE N SERIES T SERIES V SERIES VALVES

6 Tough Cooling Duties in 1 Plant Handled by 1 Model ALCO Exchanger



The Skelly Oil Company gas plant at Velma, Oklahoma, built by the Born Engineering Company of Tulsa, presented a unique problem in certain process cooling requirements. Six different cooling jobs had to be handled in one battery, calling for different heat loads, temperature ranges and operating pressures.

One Alco air-cooled heat exchanger model (the uni-bundle*) was selected to handle all these cooling duties. The customer advises "Units are operating successfully at over design-capacity." A fine example of how Alco **standardized** air-cooled exchangers can be tailored to suit customer needs—simplifying operation, maintenance, replacement of parts. Alco's **standardized** models bring low cost per year of operation and multiple savings in upkeep costs.

*Trademark patented

ARE YOU FACED WITH ANY OF THESE COOLING PROBLEMS?

- Insufficient water supply
- Scale from bad or brackish water
- Expensive water treatment
- Difficult waste water disposal
- High pumping costs
- High relative humidity
- Excessive space requirements for cooling basins

THEY CAN BE SOLVED INEXPENSIVELY BY ALCO AIR-COOLED EXCHANGERS

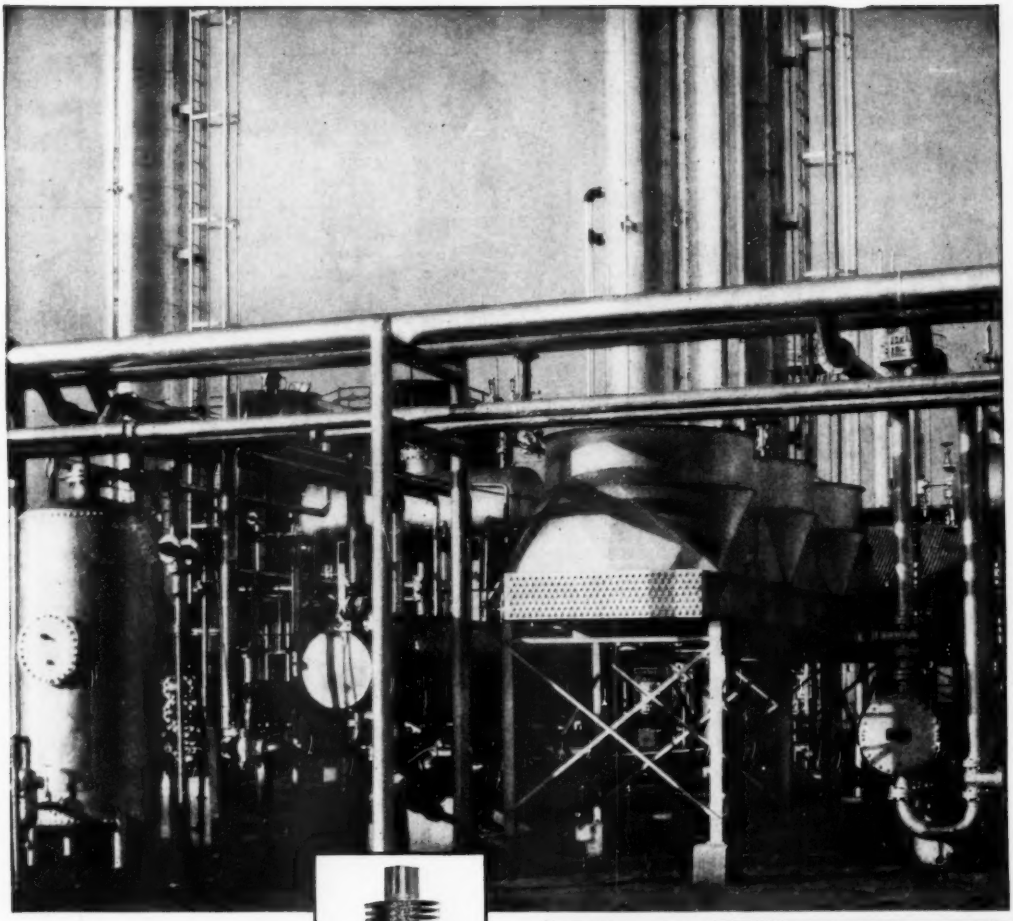
Proved in use in many of the nation's largest gas plants, in pump line stations, in power stations, in diesel locomotives—in many varied applications—Alco exchangers may be the answer to your specific problem.

ADVANTAGES OF ALCO DESIGN

1. Volume production means standardized parts, easy maintenance, low cost per year of operation.
2. Simple field installation of standardized components.
3. Fans may be driven by any form of power.
4. Natural draft construction increases efficiency, reduces power requirements. Sometimes this natural draft is sufficient to produce adequate cooling without use of fans.
5. Wind direction and velocity do not affect efficiency.
6. Cooling surfaces positioned to minimize damage from wind-driven sand, rain, hail.
7. Induced draft insures uniform distribution of air across cooling surfaces.

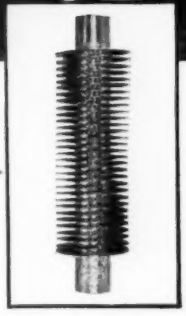
FIN-TUBE MODELS CAN PERFORM MULTIPLE DUTIES

Selection of type of cooling surface to be used should be determined by economics and process requirements. As manufacturers of both radiator core and fin-tube types, and also as one of the world's largest makers of heat exchangers, Alco is in a position to give impartial advice.



ADDITIONAL ADVANTAGES OF FIN-TUBE MODEL

1. Separate surfaces for separate cooling duties can be mounted in the same unit.
2. Header design permits variation of passes to suit process requirements of a given job, thus allowing selection of minimum surface within pressure drop limitation of the process while maintaining maximum velocity required for highest rate of heat transfer.
3. Orifices built into manifold-header design assure uniform distribution to entire cooling surface.
4. Bundle design of Alco fin-tube construction eliminates air leaks.



Quality controls of Alco fin-tube manufacture assure highest heat dissipation rate. Fins wound on under pressure and permanently bonded on tube by means of solder bath completely covering fin and tube. Easy to handle, easy to clean with compressed air.

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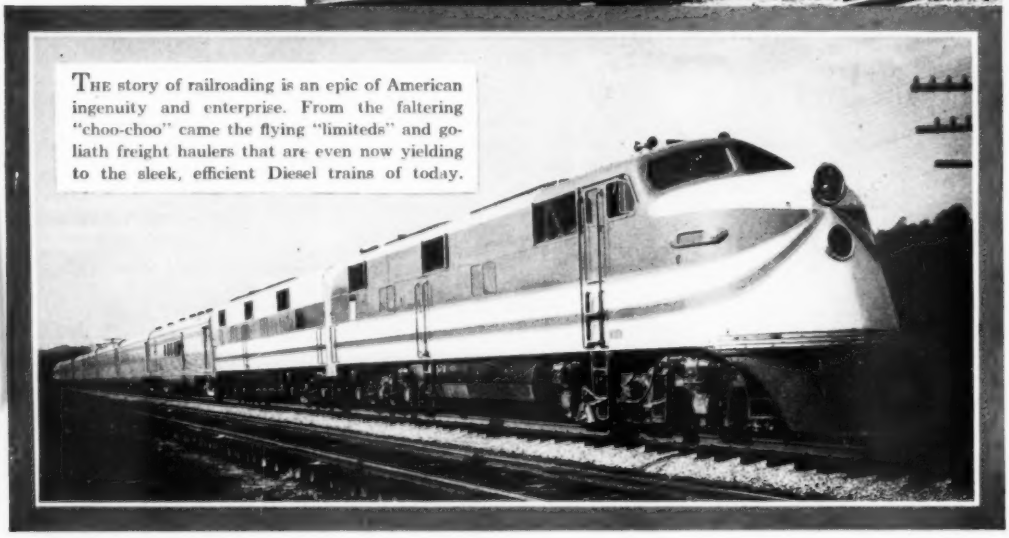

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JOURNALLY Speaking

Economics 1-A

THIS is a picture of a dime bank. The dime bank is being given to each customer who calls at a filling station of Standard Oil Co. (Ohio).

Why does Sohio give away dime banks? To teach its customers a lesson in economics. What is the lesson? That gasoline is 10 cents cheaper than it was in 1921. A few years after World War I, regular-grade gasoline sold in Ohio for 29 cents a gallon, exclusive of tax. Today Sohio's regular gasoline sells for 19 cents a gallon at the filling station, exclusive of tax. And it is much better gasoline than that sold in 1921.

If every customer will put a dime in his bank every time he buys a gallon of gasoline he will have about $60 at the end of a year. That is how much he has saved because the oil industry has lowered its prices by one-third even though its costs are much higher than they were 28 years ago. Each dime put in the bank is to remind the motorist that gasoline is the biggest bargain on the market today.

Isn't that a nice way to teach economics?

The Oil Brain

WE were reading the other day about these new "electronic brains" — computing devices with mechanical "memories." As we understand it, an operator can feed into this machine millions of facts, figures, and reference data, where they are coded and filed away on microfilm. Then when he wants to know anything about this subject the operator types out his question on a tape and after a brief period of blinkings, whirrings, and electrical gestation the answer shows up on a teletype.

This gadget holds a lot of possibilities for the oil industry. Suppose we fed it all known facts about oil, its history, geography, and factors that affect supply and demand. Then we start asking it questions, like these:

If 9,876 new oil burners are installed in six-room houses in Pennsylvania, and the price of No. 2 fuel oil declines 1.8 per cent in comparison with anthracite coal on a B.t.u. basis, and the weather is 6 degree-days colder than the average for the past 17 winters, how much fuel oil will be required?

If domestic demand for all petroleum products increases 3 per cent over last year, and if imports are cut 4 per cent, and if stocks are reduced 2 per cent, how many new wells will be drilled next year, how much oil will be discovered, and how many drill collars will be required?

Now you begin to see the possibilities. Proper use of this handy device would save endless arguments, eliminate the risk from business judgments, and might even do away with congressional investigations of the oil industry.

But we understand that these dohickies aren't on the market yet, so you'll have to continue to use the next-best thing available. That is the assemblage of data in our Midyear Review and Outlook Issue, which will appear next week. You'll have to do a lot of pencil work and skull practice to derive the answer to your own particular problem, but our statisticians are doing their best to feed you the raw material.

Economic Footnote

NEIMAN-MARCUS, big department store deep in the heart of the world's biggest oil state, apparently doesn't think that oil men are teetering on the brink of depression and bankruptcy.

Did you notice its ad in last week's issue offering solid-gold cuff links of miniature derricks and rock bits? And for only $125.00 a pair, plain, or $325.00 with diamonds.

—Henry D. Ralph

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the OIL AND GAS JOURNAL

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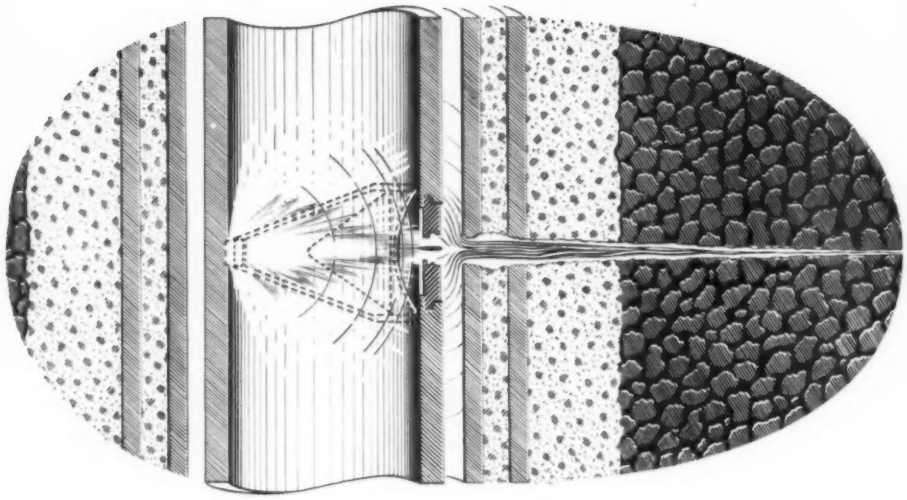

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THE OIL AND GAS JOURNAL

Pipe Liners Deliver

A LITTLE over 3 years ago, those who lay and operate pipe lines had a major industrial problem tossed their way.

Contrary to the expectation of many, it was certain then that a postwar world would require more, not less, petroleum. After a temporary decline in demand following V-J Day, peacetime consumption in this and many other countries passed the wartime peaks.

The oil business immediately realized that it had a transportation shortage. What expansion that had taken place over a period of 4 years was designed for war use. The 20 and 24-in. lines from Texas to the Atlantic seaboard helped to win a war but they had no place in normal domestic operations, and the areas they served quickly shifted back to tanker movements. This has meant more pipe-line construction to the Gulf to feed the enlarged coastwise movements.

The most acute problem had to do with supplying the great inland markets extending from Pennsylvania to the Rocky Mountains, including parts of the Southwest and the Southeast. Petroleum consumption there was already several hundred barrels daily greater than it was prewar and expanding rapidly. Transportation facilities were little larger than they were in 1941.

The first task was to get maximum performance from existing facilities, and that was done in an amazing manner. But new major arteries were mandatory if the transportation bottleneck was to be eliminated. One large system added practically 50 per cent to its capacity with big-inch installations. Another company built a 20-in. line from Texas to Illinois where it connected to enlarged existing systems.

Last week this construction program was completed when a combination system extending 1,000 miles from New Mexico through Texas and Oklahoma to Illinois was officially inaugurated. The three lines supply an additional capacity in excess of 350,000 bbl. daily.

Much remains to be done but in the language of one veteran pipe-line operator, "we are over the hump." New standards in operating efficiency have been established in station equipment and in the big-inch lines, and these new-type operations will gradually replace the old. The economy of product lines is now well established under varying conditions and their continued growth is assured.

Construction to date has been accomplished without a dime of subsidy or other special consideration by Government. The combination system inaugurated last week cost $66,000,000 and was financed by the four participating companies. The cost of other pipe-line improvements and extensions of the past 3 years, including those under construction, total several hundred million dollars. Once again pipe liners, as they have done many times in the past, have demonstrated that they can deliver.

Gain In Imports Essential, Oil Men Tell House Investigators

by George Weber

NEW YORK. — Petroleum imports, particularly of residual fuels, will increase this year and next, a subcommittee of the House small-business committee was told at a hearing held here July 14 as it continued the investigation into the advisability of limiting oil imports to this country.

A firm, unanimous opposition to government restriction on such imports was recorded by representatives of the industry invited to testify. The consensus among them was that a record demand for heating oils is anticipated this coming winter and that imports will continue to be necessary to supplement production in this country.

Testimony was taken from officers of four oil companies engaging in the production or marketing of foreign crude and products reaching this country. In addition, a representative of independent eastern marketers' groups appeared before the committee.

Holman Testifies

Eugene Holman, president of Standard Oil Co. (N. J.) largely reiterated his testimony heard in Washington last month that fears of a future domestic market flooded with foreign oil are unfounded in economics.

Holman's executive assistant, Howard W. Page told the committee that the residual-oil surplus in the East and Gulf Coast was rapidly drying up, as domestic refineries reduced residual yields as well as total crude throughput. Page reported that Jersey's crude imports for June, July, and August are estimated at 90,600, 92,000, and 44,100 bbl. daily as compared with a 1948 average of 104,900 bbl. daily. Residual imports are currently higher than last year, with June, July, and August daily averages of 125,000, 127,000, and 136,000 bbl. daily as compared with a 1948 average of 92,400 bbl. daily.

H. M. Herron, chairman of the board of California Texas Oil Co., Ltd., stated that in the Middle East a large surplus of potential production exists over the demand of buyers who can pay for it in acceptable currency—dollars. When asked whether he felt the United States was a potential market for this oil he replied yes, in possibly 10 years as a "pure guess."

Arabian Production Program Revised

Lester M. Snyder, assistant to the president of Arabian American Oil Co., explained his inability to testify directly on ultimate consumption of Saudi Arabian oil by the fact that Aramco does not market direct, but delivers in the Middle East to owning companies.

Describing the history of his company's operations, he traced the production rise from 25,000 bbl. daily in 1944 to the current average of 500,000 bbl. daily. This withdrawal, coming from 60 to 70 of the company's 100-odd commercial wells now on production, is below the MER of respective wells and fields as required by Aramco's self-imposed conservation policy, he stated. During the 4-year period 1944-1948 proven reserves increased 2.9 times, he said, but he declined to name actual figures.

Snyder stated that while production plans had formerly been projected to reach 800,000 bbl. daily, that program had been revised downward and Aramco sees no substantial increase over the 500,000-bbl. rate over the next 2 years. This, he explained, is based on firm estimates of needs given the company by its owners for 1 year in advance and rough estimates of needs over a 5-year period. Refinery operations at Ras Tanura now average about 140,000 bbl. per calendar day, he revealed, with a residual yield of about 40 per cent.

Caribbean Imports to Rise

John A. Walstrom, vice president of Asiatic Petroleum Corp., defined his company's position in the industry principally as that of a middle man between foreign producers and refiners of the affiliated Dutch Shell interests and importers of crude and products to this country. The company itself imports small quantities of bunker "C" for fueling ships. Asiatic also buys crude and products for export from the United States, as well as equipment for export, the latter in values averaging $50,000,000 annually.

Currently the company handles about 28,000 bbl. of South American crude daily for import to the United States, he stated. In addition, it sells to companies for United States import 47,000 bbl. daily of residual fuel oil from Aruba and Curacao. This current rate is expected to be sustained through 1949, he added, and may reach 75,000 bbl. of residuals daily in 1950.

Total imports to United States through Asiatic were 12,663,000 bbl. in 1947 and 16,126,000 bbl. in 1948. For the first half of 1949 the volume rose to 13,700,000 bbl. with indications that it will exceed 27,000,000 for the year. Present and anticipated future movements of crude and residual products will be needed regardless of domestic supply, he believes. Walstrom, questioned as to price, stated that the residual price to buyers for import corresponded to domestic quotations, with the seller absorbing the import duty.

Marketers Favor Imports

Unqualified opposition to any form of government restriction to imports was voiced by Harry B. Hiltz, representing the Atlantic Coast Oil Conference, Inc., which includes several independent marketers' associations from Virginia to New Hampshire. This area, he estimated, markets 55 per cent of heating oils consumed in this country.

Bullish about near-future demand for petroleum products, he predicted a 1949-1950 winter demand for heating oil—25,000,000 bbl. over the former peak for the 1947-48 season. This estimate he based on increased power-burner installations which he enumerated as totaling 875,000 in 1947, 375,000 in 1948, and an estimated 550,000 for 1949. Due to the past mild winter in the East, he said, most of the new installations never reached peak fuel demand, adding that a normal winter would reflect the cumulative fuel demand for an additional 1,750,000 power burners, most of which have never seen sustained peak operation.

Speaking for his group, Hiltz expressed concern over the domestic industry's ability to produce sufficient heating oil for a normal winter unless crude production should rise to record capacity. He repeated the opinion that petroleum imports to this country had no adverse effect on the domestic industry.

Domestic Output Too Small

He expressed confidence that his segment of the industry could generate a demand which would exceed domestic capacity, therefore requiring continued supplementary imports. Price, however, was a factor, said Hiltz, who launched a long attack on state regulatory bodies generally and the Texas Railroad Commission in particular for what he alleged to be their policy of artificial support of the crude price. He admitted that the bottleneck in refinery storage of burning oils was due in part to reluctance on the part of marketers between refinery and consumer to build stocks in the present fluctuating market.

The committee will resume its investigation with a further hearing at a date to be announced.

Texans Expect Conservative Administration Under Shivers

AUSTIN.—Allan Shivers, the new governor of Texas, though only 41 years of age brings to the governorship a thorough background of business, law, politics, and government administration.

Though he has had no direct connection with the oil and gas industry in either private or public life, he has a reputation for being conservative in politics and taxation, for businesslike administrative methods, and for an understanding of the problems of industry.

In the middle of his second term as lieutenant governor, Shivers was sworn in as governor July 16 following the sudden death of Gov. Beauford H. Jester July 11. His first public statement was that he would continue Jester's policies as closely as possible.

A native Texan, the new governor was born in Lufkin, Angelina County, October 5, 1907. He attended public schools at Woodville and Port Arthur, and was a campus leader at the University of Texas from which he obtained B.A. and LL.D. degrees. He was admitted to the bar in 1931.

ALLAN SHIVERS

Served in Senate

In 1934, at the age of 26, Shivers was elected to the Texas Senate from Jefferson County, which has a heavy labor vote, and held the seat continuously for 12 years. During this period he became chairman of many important committees, president pro tempore, and dean of the senate.

Shivers was elected lieutenant governor in 1946, at the same time Jester was elected to his first term as governor, though throughout the campaign he was out of the country as a major in the Army, serving as a military governor in North Africa and France.

Shivers was known as the most influential lieutenant governor in years, taking an active part in administration of state government. His thesis was that the state government was the biggest business in Texas and it should be put on a businesslike basis. He supported the pending amendment to have the legislature meet annually instead of biennially, advocates an annual financial budget for the state, and opposes encroachment of the federal Government into the administration of state affairs.

On taxation, he said: "We must approach expenditures and consequent taxation with the understanding that the foundation of business should not be undermined by superlatives."

Jester's political philosphy was classed as middle-of-the-road, and Shivers is felt to be slightly to the right of center. However, in recent years he has supported public health and welfare measures within the limits of the ability of the taxpayers, and may go further in this direction. During the past 20 years funds for increased governmental services invariably have come from additional taxes on oil and gas, and the matter of increased taxes on the petroleum industry will be before the legislature next winter. Unless the amendment calling for annual sessions is adopted, Shivers will have to call the legislature into special session because of the budget situation. *(The Oil and Gas Journal, July 14, page 53).*

Several years ago Shivers was author of the law extending Texas' boundary 27 miles into the Gulf of Mexico, thus beating the federal Government to a claim on the oil of the Continental Shelf. Recently, however, he has advocated compromising with federal claims, arguing that otherwise Texas stands to lose all. On this he differed with Jester, who stood firm against compromise and who was supported by the State Land Board composed of the governor, Commissioner Bascom Giles, and Atty. Gen. Price Daniel.

Since the Texas legislature normally meets only 4 months every second year, Shivers has had much time to attend to his personal affairs. He is a partner in the Port Arthur law firm of Shivers, Clayton & Kirkland and operates the ancestral farm of Magnolia Hills near Woodville, in Tyler County. In 1937 he married Marialice Shary and he now heads the Shary enterprises which include Sharyland, an estate between Mission and McAllen, citrus orchards and processing plants, banking and livestock interests, and the Mission Times, a weekly newspaper. His father, the late Robert A. Shivers, was a district judge in Port Arthur for many years.

FBI Policy Questioned In Cotton Valley Case

WASHINGTON.—A Supreme Court determination whether the Department of Justice may be required to make public reports of FBI investigators will be sought by the Government as a result of the dismissal this month of its suit against the Cotton Valley Operators Committee.

The FBI files on that case were ordered produced by Judge Ben C. Dawkins of the United States District Court at Shreveport, La., on motion of the defendants, and upon refusal of the department to obey the order Judge Dawkins granted another motion of the defendants for dismissal of the suit.

Department officials this week said that the dismissal would be appealed direct to the highest court.

The suit was filed in the Louisiana district court in June 1947, the issue being whether the processing of gas condensate by the participants in the unit-operation contract under which the field was being operated was a legal activity under the agreement or a violation of the antitrust laws.

Under the unit agreement, the 31 participants were individually the recipients of their share of the liquid products extracted from the gas, and the Government charged violation of the antitrust laws when 30 of the 31 voted to set up a refinery to process those products, and agreed to sell through a common sales agent.

As is usual in such cases, an investigation of the Cotton Valley situation was made by the FBI to develop information needed as a basis for the suit, and when the court ordered that the FBI reports and other files be produced, Atty. Gen. Tom Clark in a sworn deposition said he did not feel he had to or could produce the records under the law.

Meeting of Arkansas' Oil And Gas Commission Is Set

A meeting of the Arkansas Oil and Gas Commission has been called for July 22 at 10 a.m. at Columbia County Court House in Magnolia, Lester F. Danforth, director of conservation and production, announced.

Danforth said the group will seek "to determine if waste of oil or gas is apparent or reasonably imminent in the state."

Pipe-Line Projects Dominate Gas-Industry Expansion Plans

THE gas industry in the United States is spending $943,000,000 for new construction this year and has announced programs for spending double that sum during the ensuing 3 years, it is revealed in a survey just completed by the American Gas Association.

Expenditures for natural-gas projects constitute more than 80 per cent of the total, and by far the largest single item is for long-distance transmission lines.

The survey covers the 5-year period 1948-52, inclusive, and shows that during this period gas utility companies have programmed total expenditures of $3,539,000,000 for new construction, modernization, and replacements. This is an upward revision from a similar survey made by the A.G.A. last fall which showed projected expenditures of $3,300,000,000 for the same period. This revision indicates that expansion plans have been increased by the gas industry at a time when several other major industries have completed their postwar construction plans or have curtailed further expenditures.

1949 Expenditures Greater

Of the 3.5 billion dollars, $770,000,000 were spent in 1948, and it is expected that the 1949 expenditures of $943,000,000 will exceed last year's peak and that at least $1,800,000,000 additional will be spent during the last 3 years covered by the survey.

Figures for future years are undoubtedly underestimates, for several reasons. The survey covers natural-gas public-utility companies, which includes interstate gas-transmission lines and production and gathering facilities of such companies but does not include the production, gathering, and processing facilities of independent producers, oil companies, and other nonutility companies. It is based on projects which utility companies have programed for the future as of now, and therefore is not entirely complete as to the latter years.

Furthermore, while the tabulation included estimates for interstate pipe lines already authorized by the Federal Power Commission, it does not include applications still pending before the FPC nor several other gas lines which have been projected but have not yet been placed before the FPC for approval.

(A table showing all natural-gas pipe lines now under construction and proposed for the future will appear in next week's issue of The Oil and Gas Journal).

New Facilities Take Most

In commenting on the survey, the A.G.A. explained that the estimates include sums to be spent for modernization and replacements but the great bulk represents expenditures for additional facilities. The magnitude of this program, it says, can be partially realized by comparing this 3.5-billion-dollar estimate with the total gas-utility plant of approximately 5.6 billion dollars in existence at the end of 1947.

The manufactured and mixed-gas utilities expect to spend $500,000,000 during the 5 years, almost equally divided between distribution and production facilities. The natural-gas utility expenditures are expected to be 3 billion dollars, with transmission facilities alone accounting for approximately 1.8 billion dollars, or 52 per cent of the total expenditures by the entire gas industry.

The accompanying table shows the results of the A.G.A. survey of construction expenditures broken down by types of facilities planned.

CONSTRUCTION PROGRAM OF THE GAS INDUSTRY
(Millions of dollars)

	1948	1949	1950	1951	1952	1948-52
Total industry construction expenditures	796	943	871	581	375	3,539
Total natural gas	629	809	755	476	294	2,963
Total manufactured gas	117	110	92	86	73	478
Total mixed gas	19	20	24	19	8	90
Total liquefied petroleum gas	4	4	*	*	*	8
Natural-gas expenditures	629	809	755	476	294	2,963
Production	82	64	40	33	30	249
Transmission	367	555	542	265	103	1,832
Underground storage	†	†	15	4	9	28
Distribution	154	168	137	148	137	744
General	26	22	21	26	15	110

*Not available. †Included in production

OGD Allocation Between $325,000, $400,000 Seen

WASHINGTON.—An Oil and Gas Division appropriation somewhere between the $325,000 allowed by the House and the $400,000 called for in the president's budget was a possibility this week as a result of action by the Senate appropriations committee restoring $45,000 of the $75,000 cut made by the lower chamber.

The Interior Department appropriation bill for the fiscal year which began July 1 was sent to the floor last week by the committee with $370,000 written in for the OGD, $175,000 of which would be for enforcement of the Connally "Hot Oil" Act.

The committee also gave the Bureau $40,000 more than had the House for administration, operation, and maintenance of the petroleum experimental station at Bartlesville, Okla.

These and other increases in the bill still have to be acted upon by the full Senate, after which any changes from the House measure will have to be agreed upon by a conference committee.

More Talk Scheduled On National Oil Policy

WASHINGTON.—The subject of national oil policy appeared this week to be slated for consideration on both sides of the Capitol, although the lateness of the session makes it unlikely that any definite legislative steps can be taken this year.

On the Senate side, Chairman Joseph C. O'Mahoney of the interior committee disclosed plans to start studies to bring up to date his recommendations on oil policy made in 1947 as chairman of a special oil committee, but he did not indicate whether changes have occurred in the situation during the past 2 years which will make any modification necessary.

On the House side, the oil subcommittee of the interstate commerce committee has been hearing officials of various federal agencies in closed session, questioning them about the current world oil situation, and plans to hold some public hearings, although probably not until next winter. The subject of national policy has been under consideration by the committee for several years and was the subject of a number of hearings last session when Rep. Charles A. Wolverton of New Jersey was chairman.

O'Mahoney's 1947 policy recommendations bore down heavily on streamlining of the leasing and other laws applicable to oil development on the public lands, governmental encouragement of development of synthetic liquid fuels by private enterprise, and a political "open door" for operations abroad by American companies, but with a requirement that the companies make full disclosure of their activities to the Government.

_____this week

IMPORTS—House committee calls heads of importing companies in investigation of petroleum imports. . . . Is told that import plans are being revised downward for near future. . . . Company officials and eastern jobbers say foreign oil needed here. . . . ¶Domestic producers intensify fight for curbs on imports. . . . I.P.A.A. calls meeting in Washington to plan strategy. . . .

WASHINGTON—Several congressional investigations aimed at oil industry. . . . ¶Monopoly study reveals split over oil-industry divorcement. . . . ¶Appeal of antitrust suit against Cotton Valley unit operation will test secrecy of FBI investigations. . . .

TRENDS—Crude-oil stocks, after leveling off in June, dropped 2,393,000 bbl. for week ended July 9. . . . Total production in 6 weeks amounted to 3,270,000 bbl. or about 78,000 bbl. daily. . . . Crude stocks started their steep upward trend in September of last year. . . . ¶Daily average crude production dropped 26,950 bbl. for week ended July 16 after a decrease of 142,450 bbl. a week earlier. . . . Current production is about 785,000 bbl. daily less than the same week last year. . . . ¶Indicated crude imports averaged about 404,000 bbl. daily in the 6-week period ended July 9. . . .

TIDELANDS—House Speaker makes second attempt to draft acceptable compromise on state-federal claims to offshore oil. . . . Officials leaving conference noncommittal on prospects for agreement. . . . Plan revealed to provide complete federal control of oil and gas leasing. . . .

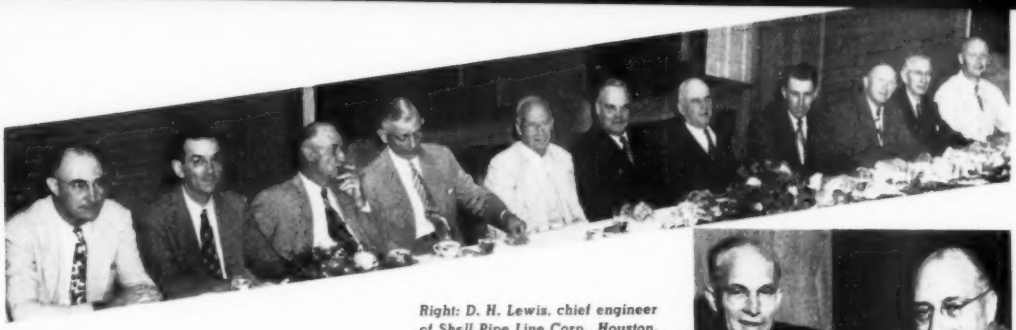
INTERNATIONAL—Foreign crude production gained in May while U. S. output was curtailed 44,000 bbl. daily. . . . Gains in Venezuela and Colombia more than offset decline in Middle East. . . . World total was down 29,000 bbl. daily. . . . ¶Alberta Legislature enacts legislation providing strict controls over export of natural gas. . . . ¶Jersey Standard halts purchase of Iranian oil until 1952. . . . Revises contract to purchase over 20-year period. . . .

NATURAL GAS—Natural-gas industry has scheduled heavy program of capital expenditures during next several years. . . . Includes more than $500,000,000 this year and next for pipe lines. . . . Also large sums for production and distribution. . . . Permit for Montana-Dakota Utilities Co., Montana-Wyoming Gas Pipe Line Co. natural-gas line from Wyoming to Baker, Mont., refused by Wyoming Public Service Commission. . . . ¶Permit sought for new natural-gas line by Eastern Natural Gas Corp. between Phoenixville, Pa., and Boston. . . . ¶Construction reaches halfway mark on Cities Service Gas Co.'s 130-mile, 26-in. line between Newton and Ottawa, Kans. . . .

PIPE LINES—Peoples Gas Light & Coke Co. organize new company to construct and operate a 1,000-mile, 30-in. line from the Houston area to Joliet, Ill. . . . Estimated cost is set at $100,000,000. . . . ¶El Paso Natural Gas Co. considering new application to build pipe line to Arizona and California. . . . ¶Texas Pipe Line Co. lets contract for 130-mile, 12-in. crude-oil line from Corsicana to Chico, Tex. . . . ¶Invasion pipe used on Lone Star Gas Co.'s new line. . . .

REFINING—Catalytic cracking unit to be installed at Indiana Farm Bureau Cooperative Association, Inc.'s Mount Vernon, Ind., refinery. . . . ¶Work started on Cities Service Oil Co. (Del.) compounding plant at Cicero, Ill. . . . ¶Quartermaster Corps puts mobile oil-testing laboratory into service. . . .

The first barges built for transportation of lubricating-oil stocks on the Mississippi River system have been delivered to Cities Service Oil Co. They were specially designed to carry lube stocks from the new Cit-Con refinery at Lake Charles, La., to the blending plant now under construction for Cities Service Oil Co. (Del.) at Cicero, Ill. (See page 109.) Each barge is 200 ft. long and is equipped with moistureproof tanks and steam coils, and the double tow has a capacity of 5,000 deadweight tons or 33,000 bbl. of lube stocks. It will require approximately 21 days to make the 3,200-mile round trip. Until the Cicero plant is completed the barges are being used in gasoline service on the Mississippi



Right: D. H. Lewis, chief engineer of Shell Pipe Line Corp., Houston, and L. H. Scherer, chief engineer of Texas Pipe Line Co., Houston

The pictures here were taken at the Tulsa dinner which closed the ceremonies inaugurating the 1,000-mile Basin and Ozark systems. Top: J. W. Emison, vice president, Texas Pipe Line Co., Houston; George R. Kinter, vice president, Tidal Oil Co., Tulsa; O. Q. Lomax, vice president, Humble Pipe Line Co., Houston; H. B. Fell, independent producer, Ardmore, Okla.; D. D. Irwin, president, Pure Transportation Co., Chicago; J. L. Burke, president, Stanolind Pipe Line Co., Tulsa; Fayette B. Dow, general counsel, Committee for Pipe Line Companies, Washington, D. C.; Loren F. Kahle, president, Interstate Oil Pipe Line Co., Tulsa; A. W. Ambrose, president, Empire Pipeline Co., Bartlesville; Ralph B. McLaughlin, president, Texas Pipe Line Co.; and T. E. Swigart, president, Shell Pipe Line Corp., (presiding). Bottom: J. L. Latimer, president, Magnolia Petroleum Co., Dallas; Burt E. Hull, president, Trans-Arabian Pipe Line Co., San Francisco; W. W. Baker, vice president, Sinclair Refining Co., Independence, Kans.; Paul D. Blazer, chairman of board, Ashland Oil & Refining Co., Ashland, Ky.; Bruce C. Clardy, general manager, products pipe line, Standard Oil Co., Indiana, Chicago; E. R. Turner, president, Pan American Pipe Line Co., Houston; O. F. Moore, vice president, Ohio Oil Co., Findlay, Ohio; M. E. Foster, president, Phillips Pipe Line Co., Bartlesville, Okla.; Gordon C. Loche, executive secretary, Committee for Pipe Line Companies, Washington, D. C.; H. H. Anderson, vice president and general manager, Shell Pipe Line Corp., Houston. Construction executives of the Basin and Ozark systems not shown are W. H. Shelley, superintendent, Shell Pipe Line Corp., Springfield, Mo., and A. N. Horne, vice president, Texas Empire Pipe Line Co., Tulsa

Basin, Ozark Pipe Lines Dedicated

ELABORATE inauguration ceremonies, including a 600-mile inspection trip, marked the dedication of the 1,000-mile Basin and Ozark Pipe Line Systems.

Walter S. Hallanan, chairman of the National Petroleum Council, was principal speaker at the Cushing, Okla., dedication ceremonies, July 12, presided over by R. B. McLaughlin, president of Texas Pipe Line Co. T. E. Swigart, president of Shell Pipe Line Corp., served as toastmaster at a dinner which followed in Tulsa, pictures of which are shown above. H. H. Anderson, vice president of Shell Pipe Line Corp., addressed a dinner meeting of the Tulsa Pipe Liners Club held in connection with the Cushing ceremony.

The extensive inspection tour gave an opportunity for observing the unique pump stations designed under the direction of L. F. Scherer, chief engineer of Texas Pipe Line Co., and D. H. Lewis, chief engineer of Shell Pipe Line Corp.

Conspicuous features of these stations are the architectural design, ventilation, control system, and the distinctive innovation of installing a half-capacity unit to give flexibility of operation with high efficiency.

Operation Unusual

Each participating company owns and controls a segment of the capacity proportionate to its share in ownership. Consequently, from a transportation standpoint, the result is the same as if each system consisted of parallel lines, separately owned by major pipeline companies.

Approximate undivided ownerships in the Basin System are: Texas Pipe Line Co., 44 per cent; Shell Pipe Line Corp., 34 per cent; Sinclair Refining Co., 13 per cent; and Empire Pipeline Co., 9 per cent. Texas Pipe Line Co. was selected to build and operate the system.

Ozark System undivided ownerships are: Shell Pipe Line Corp., 55 per cent, and Texas Pipe Line Co., 45 per cent. Shell was selected to build and operate the system, including the Wood River-Patoka extension owned by Texas Pipe Line Co.

The Basin Pipe Line System consists of 515 miles from Jal, N. M., to Cushing, Okla., consisting of pipe of the following diameters: Jal via Wink, Tex., to Midland, Tex., 20-in.; Midland to Wichita Falls, Tex., 22-in.; Wichita Falls to Cushing, Okla., 24-in. Initial capacity is 167,000 bbl.; ultimate capacity to be achieved by additional pump stations would be 241,000 bbl. daily.

The Ozark Pipe Line System has a 433-mile, 22-in. line from Cushing, Okla., to Wood River, Ill. Initial capacity is 187,000 bbl.; ultimate capacity, 260,000 bbl. daily.

The Patoka extension of Texas Pipe Line Co. has 54 miles of 22-in. from Wood River to Patoka, Ill. Initial capacity 187,000 bbl.; ultimate 260,000 bbl. daily.

WASHINGTON WATCHING

BY BERTRAM F. LINZ

Oil on the Pan

WASHINGTON. — Oil-company executives are going to get a good taste of Washington's summer weather if all present and projected congressional investigations are carried out.

At least a half-dozen inquiries are on the fire or waiting for space, although there is little likelihood that any of them will develop into legislation this year.

For instance, Rep. Wright Patman of Texas has his small-business committee working on the import problem and plans to turn it loose on divorcement of marketing from other branches of the industry.

Rep. Emanuel Celler of New York has started his judiciary committee investigation of monopoly, and sooner or later oil is bound to come into the picture.

Sen. Guy M. Gillette of Iowa is head of an agriculture subcommittee studying the use of alcohol from agricultural products as motor fuel. Gillette, incidentally, is the author of three bills calling for divorce in the oil industry and, again incidentally, Paul Hadlick, who was special counsel on oil for Senator Wherry's small-business committee in the last Congress, is serving as consultant to the agriculture committee.

Meanwhile, the Senate banking committee is investigating the prices of gasoline, and the Senate interstate commerce committee has been looking into transfers of American vessels to foreign registry, starting out with an inquiry into the application of Standard Oil Co. (N.J.) to the Maritime Commission for authority to transfer some of its older tankers to Panamanian registry in order that new, high-speed tankers now under construction can be registered under the United States flag.

Looks Like Crowell

POSSIBILITIES that action may be taken shortly to fill the post of director of the Oil and Gas Division, vacant since Max W. Ball resigned last December, were seen this week in a meeting between Assistant Secretary of the Interior C. Girard Davidson and Alec M. Crowell, Shreveport, La., oil and gas consultant.

The meeting was suggested by Interior Secretary J. A. Krug, who proposed that Crowell meet Davidson in New York last week. Unable to keep that engagement because of matters in Washington, Davidson wired Crowell a request that he come to the Capital this week.

Whether the purpose of the meeting was to talk about Crowell's taking the directorship was not indicated in the exchange of telegrams, which referred merely to a discussion of Oil and Gas Division matters, but some weeks ago Crowell wrote Krug that he was concerned about the future of the OGD and has told friends he would be willing to take the job if asked. He served in the organization in its early days, having been called in by then director Ralph K. Davies to organize the production and reserves division.

Meanwhile, however, there is considerable talk that William J. Murray, Jr., chairman of the Texas Railroad Commission, might be offered the post, but his decision is seen dependent upon his evaluation of the changes in the political situation in Texas as a result of the death of Gov. Beauford Jester, with whom he had strong ties.

The fact that Davidson and Crowell are discussing the OGD, however, is seen as a strong indication that the director's post may be filled shortly, possibly by the time the National Petroleum Council meets July 28.

Oil, Spies, and FBI

DISMISSAL of the Government's antitrust suit against the Cotton Valley Operators Committee in the federal District Court at Shreveport because of the refusal of the Department of Justice to produce FBI reports and other files on which its case was based has focused oil-industry attention on a situation which has been plaguing the department now for some time.

While the demand for opening of the FBI files received great publicity in the recent trial in Washington of Judith Coplon, department employe charged with stealing government documents allegedly for the purpose of turning them over to a foreign power, the same demand has been made in several other cases of less import during the past year.

In the Coplon case the Government considered the issue so vital that it made the FBI files public in court, but it has consistently refused to do so in other cases. As a result, a department official in Chicago was held in contempt of court; suits against the Government for damages arising out of the Texas City disaster will be tied up while the point is fought through the courts, and the Cotton Valley case will be tied up until next year.

Department officials are admittedly concerned over the matter and are looking to the Supreme Court decision in the Cotton Valley case to learn whether the traditional secrecy of FBI activities is to be upheld or demolished. This case is the only one of several in which the issue has been raised that can be appealed direct to the top court, the others having to go through the usual appeals machinery.

Security Skullduggery

PRESIDENT TRUMAN last month sent Congress a reorganization plan under which the National Security Resources Board would be transferred to the executive office of the President along with the National Security Council, with the President authorized to select the members who are to be responsible for operating those organizations

In some quarters, considerable significance is attached to the failure of the President to mention that his appointees will be subject to confirmation by the Senate, and the question has been raised whether this type of reorganization might make it possible for Truman finally to get his friend Mon C. Wallgren in as chairman of the NSRB.

It will be recalled that Wallgren's nomination hung fire in the Senate for months, and finally was called back by the President a few weeks ago when it became evident there was no chance whatever of confirmation. Since then there has been considerable speculation regarding the chances of various men for the post but the President appears to have decided to defer action until he gets the security council and board under his direct control.

Under the terms of the Reorganization Act, plans proposed by the President automatically become effective 60 days after their submission to Congress if neither House nor Senate turns them down. There is some question whether Congress will remain in session for the 60 days required for the seven plans the President announced last month (no reorganization can be put into effect while Congress is not in session), but if it does stay in Washington the Senate, at least, is expected to demand that the question of confirmation of the NSRB head be cleared up before the NSRB shift goes through.

Demand for Gas Oil, Diesel Oil Dictates West Coast Oil Policy

LOS ANGELES.—The demands for gas oil and diesel oil on the West Coast have increased so much that these products have supplanted fuel oil as the dominant petroleum products in determining the quantities of crude oil required by California refineries.

In May this year crude production of 1,050,000 bbl. daily was required to supply the gas oil and diesel-oil needs, taking into consideration the seasonal changes in actual consumption. For the same period a crude-oil production of 882,000 bbl. daily would have been sufficient to meet the needs for fuel oil, and in the case of gasoline, the other principal product, an output of 941,000 bbl. of crude oil would have been adequate.

This shift in the basic product control of California operations is one of several conditions reflected in a report released last week by the Oil Producers Agency of California. In April the agency's directors, realizing there were important changes under way affecting both the supply and demand for petroleum on the West Coast, authorized the appointment of a committee to review conditions. A detailed preliminary report was made to the directors on June 15 and last week a summary of this analysis was released to members of the agency and to the California industry.

In its general conclusions the report states that the current supply of petroleum in District 5 (California, Oregon, Washington, Arizona, and Nevada) is greater than needed for all products with the possible exception of distillate fuel. This excess supply, amounting to approximately 100,000 bbl. daily currently, was apparent in varying amounts last year and so far this year with an increase for the 16 months totaling 22,291,000 bbl., or 24.5 per cent. It is pointed out, however, that compared with past levels of inventories in District 5 present stocks particularly when based on days' supply "do not appear to be burdensome."

The review explains that the excess supply largely centers in fuel oil. While this still remains a problem, it is pointed out there are changes under way which are constructive. The lower prices for fuel oil have improved the demand for the product and the reduction of 55,000 bbl. daily in California's heavy-oil production has tended to reduce output. Furthermore, it is agreed that California refiners, realizing the importance of this problem, are doing everything they can to decrease the yield of the residual product including, in some instances, the installation of new processing equipment.

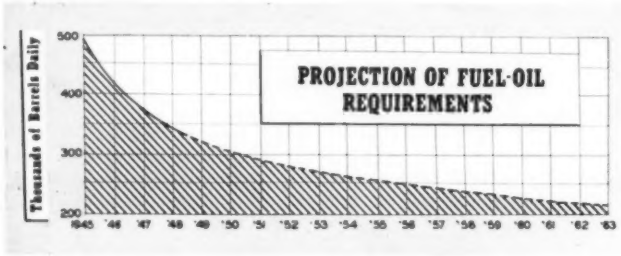
Since domestic supplies are adequate to take care of District 5 requirements there is no need to supplement production within the district with outside supplies, the report emphasizes. For the first 4 months of this year the average importation into the district from other states and foreign countries was 26,000 bbl. daily which, the analysis states, displaced the equivalent of 43,000 bbl. of California crude oil.

Data are presented showing a small decline in drilling and development activity to date this year compared with the last quarter of 1948. So far, it is explained, this has not tended to reduce the quantity of oil available or the quantity going into storage.

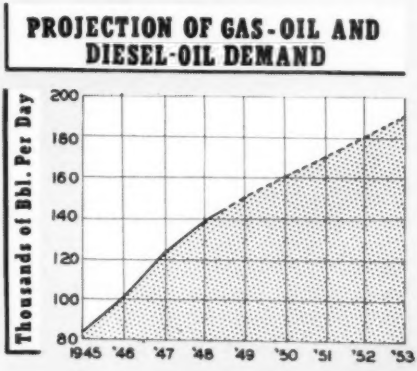
Changes in Demand

A large part of the report is devoted to an analysis of the changes in demand for the principal petroleum products (gasoline, intermediates, and residual). For the 10-year period 1939-48 the demand for all California petroleum products increased from 675,000 bbl. daily to 973,000 bbl. daily, a gain of 44.15 per cent. However, for this period the gain in gasoline demand was 70 per cent, stove and diesel oil 66.26 per cent, with the gain in heavy fuel only 36.14 per cent. A relatively small growth in fuel-oil requirements has been brought about by several developments, principally the reduced needs of railroads and vessels. Owing to the reduced demands for the heavier oils the actual consumption of all oils, according to the latest available data, this year has been slightly under the same period last year.

While there has been some improvement in demand for fuel oil in recent weeks, as shown in the accompanying chart the committee feels the trend in fuel oil demand in coming years will continue to be downward. One factor in this development is the increased consumption of natural gas. This includes the importation of gas from Texas and other states, the gas being used in part to supplant the former use of residual fuel. The estimated imports of natural gas into California for the first 5 months of 1949 were 270 M.c.f. daily, which was estimated to be the equivalent of 45,-


PROJECTION OF FUEL-OIL REQUIREMENTS
Thousands of Barrels Daily
500
400
300
200
'45 '46 '47 '48 '49 '50 '51 '52 '53 '54 '55 '56 '57 '58 '59 '60 '61 '62 '63

Above: Chart showing requirements of fuel oil on the West Coast since 1945 and estimates of future needs. Drawing illustrates graphically the sharp drop in fuel-oil demand since the war and the expected further cutback in fuel-oil needs



Right: Chart showing the tremendous growth in West Coast demand for gas oil and diesel oil and illustrating what oil men think about the future for these classes

000 bbl. daily of fuel oil. With stocks of fuel oil continuing to increase, the only encouraging condition to which the committee could point was the fact that inventories are still substantially less than they were prewar.

It is estimated the demand for distillate this year will average 150,000 bbl. daily and will increase steadily to 180,000 bbl. daily by 1952. The western railroads, which did not account for any of the distillate consumption in 1937, are estimated to have used 11,360 bbl. daily of diesel fuel the first quarter of this year. There is no current shortage of distillates, and stocks can be expected to increase seasonally over the next several months.

No Gasoline Shortage

In regard to gasoline, while stocks currently are below normal levels there is no present shortage in supply, according to the investigators. Continued increases in demand are anticipated although the rate of increase may be less than it has been in the immediate past.

In discussing the significance of refinery processing as a means of supplying the changed demands, data are presented showing that the yields of residual fuel oil have decreased from 43.1 per cent in 1932 to 36.2 per cent in 1948. For the same period distillate yields have increased from 10.1 per cent to 18.7 per cent, with yields of gasoline practically constant at 40 per cent. This year there has been a decrease in distillate yields to 16.8 per cent. In regard to gasoline yields, the data show that present-day gasoline has 4 per cent more natural gasoline than it had in 1932.

The review shows that there has been a slight increase in the percentage of the lighter-gravity crudes in recent years, which accounts in part for the changes in yields. The fact is stressed that the refinery-yield patterns in California are not at this time suited to the product-demand pattern. This explains the fact that in order to supply the gas-oil and distillate requirements more crude is run to stills than is needed for fuel oil and gasoline.

"These relationships," the report concludes, "have undergone marked changes since the first of the current year, and it is known that many refinery construction programs are either in the planning stage or are actually under way. For the long term, therefore, there is reason to believe that California refineries will utilize greater percentages of heavy crudes and fuel oil to produce greater quantities of the lighter products, particularly distillate fuels and gasoline. This prospect is in the future, of course, and is a promise of more efficient utilization of California crudes some time within the next 2 to 3 years."

report on national oil policy earlier this year, to which at least one of the importing companies said it subscribed, but independent producers charge that actually the companies have not carried out their declared intention of cutting back their imports.

However, there appears to be a difference of opinion as to whether present imports are of a volume that "supplements" or "supplants" domestic production. Eugene Holman, president of Standard Oil Co. (N. J.), holds to the view that the present level is merely supplementary, since it is not as high as exports, but the producers contend that position is based upon a calculation of exports which includes shipments for use by our military services outside the country, which they consider as part of the domestic demand inasmuch as that oil does not enter into foreign trade.

In asking for the NPC study of imports, Krug said that he, too, felt a more detailed and specific inquiry was desirable and necessary. More recently he agreed that imports would be dangerous when they reach a level that might halt or seriously curtail domestic exploration and development, although, apparently, he did not believe that point has yet been reached since drilling and discoveries are still ahead of last year.

I.P.A.A. Executive Committee to Study Imports Question in 2-Day Meeting

WASHINGTON. — Members of the executive committee of the Independent Petroleum Association of America will hold their July meeting in Washington, instead of in the field as normally, to dig deep into the question of oil imports.

The committee's meeting July 19-20 will largely be devoted to this one subject, and will explore the possibilities for suggestions to the National Petroleum Council, Congress, and the State Department as to how the increasing importations of oil might be stemmed.

I.P.A.A. officials pointed out last week that, on the basis of American Petroleum Institute figures on domestic production and runs to stills, the refining of foreign crude is at a record high level.

The Texas delegation in Congress, before which the I.P.A.A. laid its case earlier this month, meanwhile was engaged in its own study of the import situation, and members of the delegation met with State Department officials July 15 to get the latter's views on both the policy of the administration and the import level which the department considers proper.

The department itself, it was learned, has been studying current world oil conditions in an attempt to determine probable future trends and the possible effect of new developments such as the bringing in of large new fields in Canada, the proposed loan to Mexico, and the development programs of other countries, particularly in Latin America.

While pinning their hopes chiefly on the Thomas amendment to the Reciprocal Trade Act, which would set up quotas for the import of oil, I.P.A.A. members believe there are other steps also that might be taken to take the pressure of imports off of domestic production.

The views of the independent producers will be submitted to the National Petroleum Council at its meeting here July 28, when it is due to act on a request by Interior Secretary J. A. Krug that it appoint a committee to study and make recommendations with respect to the matter of imports.

The import question was covered, in general fashion, in the council's

Ozark Sinks Pipe Which Floated Up in Mississippi

After the 22-in. pipe line of the Ozark Pipe Line System floated to the surface of Mississippi River, near Hartford, Ill., during the night of July 14, it was successfully lowered to a position on the river bottom where it will be put in regular operation. The line has been tested and found to be in good condition.

An unusual combination of circumstances was responsible for the pipe coming up from river bottom where it had been buried. Owing to a communication difficulty, air had not been bled rapidly enough. Floating of the pipe started in shallow water in a trench on the Missouri side where the pipe was to be backfilled with land equipment, which had been delayed by the boggy condition of the ground. Once the pipe started to float in the 6-ft. depth of water there, the remainder of the pipe in the river worked its way to the surface.

Within 10 hours the pipe was sunk to the river bottom. Only one river tow was delayed by the operation. The pipe did not drop back exactly into the original trench but the line had been laid with sufficient camber to insure safety. Weights of pipeline materials per foot at Ozark's Mississippi River crossing are as follows: steel pipe 113 lb., welding sleeves 5 lb., coating 7½ lb., total 125½ lb.

International

WORLD-WIDE OIL DEVELOPMENTS

Alberta Legislators Vote Strict Controls for Gas Exporters

STRICT control over Alberta Province's natural-gas resources is provided in the Gas Resources Preservation Act passed last week by a special session of the Alberta Legislature.

The act gives the Alberta's Petroleum and Natural Gas Conservation Board almost unlimited power in regulating activities of natural-gas pipe-line companies operating in the area, and it prohibits the export of natural gas from the province without a permit.

The conservation board is empowered, for example, to designate pools from which permit holders may acquire their gas, fix the maximum monthly and annual production or purchase allowables, determine maximum daily and hourly rates of production or withdrawal and provide for ratable withdrawals from wells in a given pool.

The new act also provides that any export pipe-line company may be required to supply gas at a reasonable price to any community or consumer in Alberta which is willing to take delivery of gas at a point on the pipe line and which "in the opinion of the board can reasonably be supplied by the . . . pipe line."

Must File Data

Companies making application for gas-export permits must file detailed information on many related subjects with the board.

Among the data required for submission with the application are: description of fields from which gas will be taken; estimated reserves of each field and the technical data used in computing them; proposed marketing areas of the company and meteorological records of these areas to be used as a guide in determining load factors and climatic conditions; estimated maximum hourly peak load required; estimated number of domestic, commercial and industrial consumers to be served and the estimated hourly peak load for each class; and details of the specific uses of the gas by the consumers.

During the same legislative session the Alberta House adopted several amendments to the Oil and Gas Resources Conservation Act of 1942.

These include provisions which would allow the conservation board to fix oil and gas production allowables by pools and to prorate the aggregate allowable among individual operators.

The House also added to the act an existing law authorizing the conservation board to declare any pipe line a common carrier and prohibiting the carrier from making any distinction in treatment among sources from which it takes production or from favoring its own production.

A new section added to the 1942 act by the House prohibits the manufacture of carbon black, limiting the use of gas to gas-lift activities, repressuring, and as light or fuel.

The House amendments included some provisions transferred from the old Pipe Line Regulation Act, which had been repealed. These give the conservation board power to fix a provincial allowable for oil and gas not to exceed the current reasonable market demand. This allowable would be allocated among all pools in the province by fixing an allowable for each pool. The pool allowables then would be prorated among producers to give each the opportunity to receive a pro-rata share.

Another amendment, from the Pipe Line Regulation Act, would give the board power to shut in or restrict wells for repressuring, to order resumption of production, or to order sale of gas to a designated person if it were "in the public interest."

Two Refineries Reported Planned for South Africa

Two refineries are reported to be in the preliminary stage of planning for construction at Durban in the Union of South Africa.

One plant is being considered by a combination of American interests. The second is that planned by Union Petroleum Refinery (Pty.), Ltd., a South African company.

Harold Moore, managing director of Union Petroleum Refinery, said recently that negotiations for the construction of this plant are proceeding satisfactorily. A report from Durban said Union Petroleum Refinery expects to start work in about 6 months and complete within 3 years.

The Union of South Africa now imports about £16,000,000 in petroleum products a year with a motor-fuel consumption of 250,000,000 gal. (about 19,000 bbl. daily). Another project planned in South Africa is the coal-to-liquid fuels plant of Anglo-Transvaal Consolidated Investment Co., Ltd., which has been granted a government license. This would use coal deposits of the Vredefort district of the Orange Free State.

Puerto La Cruz Refinery Will Serve Three Firms

The 30,000-bbl-per-day refinery under construction by Venezuela Gulf Refining Co. at Puerto La Cruz, Eastern Venezuela, is under full construction, and initial operation is anticipated for July 1950. Venezuela Gulf, a Delaware corporation, was organized originally as a wholly owned Gulf subsidiary to build, own, and operate the Puerto La Cruz plant. Under a recent agreement, two other oil companies, Texas Petroleum Co. and S.A.P. Las Mercedes, affiliates of The Texas Co., have acquired a one-third stock interest in Venezuela Gulf Refining Co. The refinery, originally planned for a capacity of 20,000 bbl. daily was increased to 30,000 bbl.

Pemex Completes Prolific Well in Golden Lane Area

Petroleos Mexicanos recently completed its No. 28 well in the Moralillo field area of the Golden Lane district in Vera Cruz. Reports indicated the well tested for about 1,500 bbl. daily.

The well is on property which before expropriation was developed by Huasteca Petroleum Co. It was said the No. 28 well was one of 11 being drilled which would increase production of the area to 6,500 bbl. daily.

Gain in Venezuela Boosts World Production Above April Figure

by Dahl M. Duff

MOST noteworthy feature in the country-by-country statistics on crude-oil production during the month of May was the increase in Venezuelan output from the low levels of earlier in the year.

May production in this largest petroleum-exporting country was listed in government reports at 1,292,000 bbl. daily, a gain of nearly 8 per cent over the daily average for April.

There appeared to be a feeling that Venezuelan production probably reached its lowest point in March and that the total for the remainder of this year will hold near the May level or possibly go slightly higher. Venezuela's output hit 1,383,000 bbl. daily last October, then, principally as a result of the decline in demand for heavy fuel oil, dropped off in succeeding months to the 1,155,500 bbl. daily shown in government reports for March.

The May production was divided into 412,148 bbl. daily in Eastern Venezuela and 879,832 bbl. daily in the western part of the country. Production of Creole Petroleum Corp. has been around 600,000 bbl. daily recently against 635,000 bbl. daily average in 1948 and 589,000 bbl. daily in 1947.

Gain Is Slight

As a result of the climb in Venezuelan production, total foreign production during May showed a relatively slight gain of about 15,000 bbl. daily. This is exclusive of the Russian producing areas, for which no official information has been available in most cases for more than a year.

Venezuela's increase was sufficient to offset the drops which were reported for most other foreign areas, including all the major producers in the Middle East. United States' production for May declined about 44,000 bbl. daily under April to 4,968,000 bbl. daily, and due to this decline, total indicated production throughout the world was down some 29,000 bbl. daily during the month. The production total for the world during May approximated 9,169,500 bbl. daily.

A drop in Canadian production for May was indicated on the basis of the weekly reports of the Alberta Conservation Board. For April the official dominion report listed 61,500 bbl. daily for all of Canada. The Alberta reports indicated an output of about 49,300 bbl. in that province in May. This, together with the approximate 4,400 bbl. daily produced

elsewhere in Canada, gives 53,700 bbl. daily for the month. The weekly Alberta reports for June give an average of 51,800 bbl. daily. These Canadian figures include natural gasoline.

Production in Colombia, including condensate from De Mares concession, reached a new high for the country at 89,397 bbl. daily. Less the lighter fractions, the total was 87,098 bbl. daily. Included was 32,321 bbl. daily of crude from De Mares, 25,952 bbl. daily from Barco, and 23,887 bbl. daily from Yondo.

Although Argentina has withheld information on its crude production since early last year, unofficial reports indicate output recently dropped back to about 62,000 bbl. daily from the previous average of about 67,000 bbl. daily.

The month saw an over-all decline of nearly 5 per cent in production in the Persian Gulf area. These producers have been affected by the slowdown in world petroleum demand, and the spectacular increases made in this area last year are no longer anticipated.

Middle East output in May averaged 1,417,600 bbl. daily. Each of the three major producing countries, Iran, Kuwait, and Saudi Arabia, showed declines of around 22,000 bbl. daily. Iraq's output continued to be held down by the closing of the Haifa pipe line, but this will be offset this fall when the new 16-in. line to Tripoli goes in limited operation. Arabian American Oil Co.'s June report shows a further decline to 481,118 bbl. daily from the 502,200 bbl. daily in May.

Changes Not Important

There were few significant changes in production in the European area. Germany's output in May fell back somewhat from the April average, but the preliminary figure for June indicates a new postwar high in that country with 69,180 metric tons (16,300 bbl. daily). In Egypt, where new fields were opened earlier on the Sinai Peninsula, May production was down to about 44,800 bbl. daily.

Information on the production level in the Far East continued to be limited, but recent estimates place total Indonesia output at around 125,000 bbl. daily with 5,000 bbl. daily from the new field in western New Guinea. A new discovery was recently reported in the Potwar region of Pakistan, but it will be some time before it is felt in actual producing operations.

WORLD CRUDE-OIL PRODUCTION
(In thousands of barrels daily)

Country—	May 1949	Previous month
Western Hemisphere:		
Argentina	62.0	62.0
Bolivia	1.9	1.9
Brazil	0.2	0.2
Canada	53.7	61.5
Colombia	89.4	88.0
Cuba	0.2	0.2
Ecuador	7.0	7.0
Mexico	165.5	160.3
Peru	40.1	40.1
Trinidad	56.3	56.8
Venezuela	1,292.0	1,200.2
Total	1,759.3	1,678.2
Europe and Africa:		
France	1.1	1.1
French Morocco	0.4	0.4
Germany	14.7	15.3
Italy	0.2	0.2
Netherlands	11.3	11.7
Egypt	44.8	48.2
United Kingdom	0.9	0.9
Total	73.4	77.8
Middle East:		
Bahrein	30.2	29.9
Iran	566.8	589.3
Iraq	60.3	61.5
Kuwait	258.1	280.9
Saudi Arabia	502.2	523.6
Total	1,417.6	1,485.2
Far East:		
British Borneo	70.0	69.0
Burma	0.5	0.5
China	1.8	1.8
India	5.3	5.3
Indonesia	125.0	120.0
Japan	3.6	3.6
New Guinea	5.0	5.0
Pakistan	1.9	1.9
Total	213.1	207.1
Total, foreign less Russia and Eastern Europe	3,463.4	3,448.3
Russia and Eastern Europe:		
Albania	1.0	1.0
Austria	17.5	17.5
Czechoslovakia	0.9	0.9
Hungary	10.0	10.0
Poland	2.6	2.6
Romania	80.0	80.0
Russia	625.0	625.0
Yugoslavia	1.1	1.1
Total	738.1	738.1
Total foreign	4,201.5	4,186.4
United States	4,968.0	5,011.8
World total	9,169.5	9,198.2

Figures are authoritative for all countries in the Middle East and most of the more important producing countries in the Western Hemisphere and Europe. In those cases where March production or a reliable estimate was not available, the daily average for the previous month has been carried forward. Figures in the column, "previous month," do not agree in some instances with those heretofore published for April since revisions have been made on the basis of subsequent information. No up-to-date figures are available for Russia and the Russian-dominated countries of Eastern Europe, and here the data are the latest obtainable. Other information in this tabulation is from official government or company reports and reliable private sources.

20-Year Standard Contract to Buy Persian Gulf Oil Revealed

STANDARD OIL CO. (N. J.) has revised its agreement with Anglo-Iranian Oil Co. and arranged for the delivery of about 800,000,000 bbl. of crude oil over a 20-year period commencing January 1, 1952.

The Jersey company in 1947 entered into an agreement with Anglo-Iranian for substantial purchases of Persian Gulf oil. A similar contract was made by Socony-Vacuum Oil Co., Inc., and the two companies took upwards of 100,000 bbl. daily.

Information submitted by Jersey Standard in connection with its recent $150,000,000 issue of 25-year debentures disclosed that the agreement with Anglo-Iranian was amended last April discontinuing deliveries until January 1952. This conforms to statements by Eugene Holman, Jersey president, before a House subcommittee last week that purchases from outside suppliers in the Middle East had been halted.

Price Can Fluctuate

The 800,000,000 bbl. which Jersey Standard will take beginning in 1952 will be at prices which will vary in relation to Anglo-Iranian's costs. Jersey Standard has certain rights to cancel at the end of 10 or 15 years on 5 years' prior notice. Delivery will be made f.o.b. Persian Gulf until completion of the Middle East Pipelines, Ltd., project to the Mediterranean.

The crude-purchase agreement also is subject to termination if the corollary agreement for the Middle East Pipelines project is ended. Jersey and Socony-Vacuum hold minority interests in the Middle East line, which is now estimated to cost an aggregate of $268,000,000. The other interest is held by Anglo-Iranian with 60.9 per cent.

The shareholders have agreed to provide the necessary financing by purchase of stock and by loans, and on completion will share ratably in the line's capacity in accordance with their holdings.

The agreement regarding the pipe line, which also was amended last April, provides that the three shareholders will, if certain conditions as to construction have not been met, review the situation at the end of 1956 and again at the end of 1961. If at either time at least two of the shareholders do not agree that the project will proceed, the pipe-line agreement will terminate then and deliveries under the crude-supply agreement 5 years later. If construction of the pipe line is not substantially commenced by the end of 1966, the pipe-line agreement will terminate, but this will not affect the crude-supply agreement.

In July 1949, the Jersey subsidiaries, including those in Europe, and Standard-Vacuum Oil Co. were expected to obtain about 161,000 bbl. of crude and products daily from the Middle East area. Of this, about 7,000 bbl. daily was from the Jersey interest in Iraq Petroleum Co., Ltd., about 110,000 bbl. daily through the interest in Arabian American Oil Co., and the remainder purchased.

Additional details also were disclosed concerning last December's purchase by Jersey of a 30 per cent interest in Arabian American Oil Co. A 10 per cent interest in Aramco was obtained at the same time by Socony-Vacuum.

The interest cost Jersey Standard approximately $74,000,000 but its shares are not eligible for dividends until certain dividends have been paid on the prior-issued stock. Preferential dividends for this prior-issued stock totaling about $67,000,000 have been paid or provided for covering 1947, 1948, and 1949. Starting in 1950, the preferential dividend on such stock is to be equivalent to 10 cents a barrel on Aramco's net production until 3,000,000,000 bbl. have been produced. This is on Aramco's net production and the dividends are to be cumulative.

The Jersey company has entered into agreements with Aramco which provide a long-term supply of crude and products. The company's indirect interest in the estimated proved crude reserves of Aramco, based on information as of January 1, is approximately 2,000,000,000 bbl.

On this basis, Aramco's total proved crude reserves would amount to approximately 6,660,000,000 bbl.

Venezuelan Policy Study Group Extended 6 Months

The government committee studying a national oil policy for Venezuela has been extended for an additional 6 months beyond the original July 1 date for completion of its work, according to reports from Caracas.

The group, consisting of several officials and engineers representing the government, was set up by Dr. Pedro Ignacio Aguerrevere, former minister of fomento, and held its organization meeting March 28. It subsequently called on the operating companies for detailed information on their plans and asked the companies' opinions on long-range policy questions.

With its extension, the committee is not expected to make its report before late in the year. It has been widely predicted that the committee will recommend that granting of concessions be resumed.

Uruguay May Make Oil-Meat Deal With U. K.

THE possibility was seen last week that Uruguay may become a second Latin American country to enter into a barter deal with Britain involving sterling oil.

Negotiations for a trade agreement were to be opened early in July in Montevideo between Uruguayan and British government officials.

Much the same conditions that led to the recent Argentine-British "oil for meat" trade agreement appeared in relation to Uruguay. The country is seriously short of dollars and is now spending about $15,000,000 annually for petroleum.

Reports from Montevideo said Uruguay may ask payment in petroleum for shipments to Britain of meat. Uruguay has a greatly increased surplus—90,000 tons—of meat available for export. Last year Britain took 34,000 tons of the exportable surplus of 55,000 tons.

It was said that some of the British experts who assisted during the 5 months negotiations in Buenos Aires preceding the Argentine-British pact are expected to go to Uruguay "to examine the possibilities of future trade relations" between the two countries.

The 5-year Argentine-British agreement involving some 5,000,000 tons a year (about 100,000 bbl. daily) of crude and products is considered to have virtually excluded dollar-produced oil as well as some other American products from the Argentine market. The agreement was deplored in Washington, and the State Department protested to Britain.

If such an agreement materialized between Uruguay and Britain, the effect on American producers would be parallel, though the quantities involved are much smaller. An indication of Uruguayan petroleum requirements is shown in imports which in 1947 totaled 4,804,000 bbl. (about 13,200 bbl. daily). Of this total, 2,841,000 bbl. were crude oil.

Uruguay's products exports totaled 1,383,000 bbl. in the same year, with bunker loadings of 208,000 bbl.

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Rayburn Reports Progress on New Proposals for Tidelands

WASHINGTON. — House Speaker Sam Rayburn of Texas laid new proposals for solution of the tidelands problem before Atty. Gen. Tom Clark and Interior Secretary J. A. Krug last week and at the close of a 2-hour discussion said "real progress" had been made and state and federal authorities were closer to agreement than at any time before.

There were indications, however, that the two sides were still far apart on important questions. The state officials are to make further suggestions this week, and Rayburn expressed the hope that these will create a basis for agreement on legislation on control of the tidelands.

Rayburn and Texas, Louisiana, and California officials laid the new formula before the federal officials July 15, after he and the state representatives had discussed it over a period of several days.

The Speaker, who has been pressing the matter in the hope of securing a settlement of the controversy in time to embody it in legislation this session, expressed the view that if no agreement is reached in the next few days it is unlikely that the state and federal governments will ever find a common meeting ground.

Charges Drilling Stifled

There were indications that Krug, at least, was unwilling to make any major concession in order to reach an agreement. Earlier in the week, he charged that the fight by state officials to change the Supreme Court decision in the California case and avert similar decisions next year in the case of Texas and Louisiana has stifled oil drilling in the submerged lands, and declared the public interest would be served "if there were general acceptance of the court's decision."

Rayburn would not disclose what his latest proposal was but reportedly it acknowledged the paramount rights and powers of the Government over the submerged lands but named each coastal state as the federal Government's agent to manage and develop the oil resources within a 3-mile limit, with a division between the federal and state governments of the revenues from the submerged oil lands to the limit of the Continental Shelf.

The plan was laid before the Texas, Louisiana, and California state officials at a meeting early in the week, and 24 hours later they submitted their views to Rayburn.

Reportedly, there were two points to which state officials took exception. The Texas officials objected to a 3-mile limit in view of their contention that the state's boundary is $10\frac{1}{2}$ miles out in the Gulf, and other officials talked about a 50-50 split of revenues instead of the Rayburn formula of $62\frac{1}{2}$ per cent of the take from within the 3-mile limit to go to the states and $37\frac{1}{2}$ per cent from operations beyond that point.

Rayburn's plan was embodied in a 20-page bill which would be introduced in Congress if acceptable to Clark and Krug. Federal ownership of the Continental Shelf is acknowledged, but the states would be given police powers over the entire area, which presumably would include the powers of taxation and conservation.

Leasing Outlined

Leases in the Continental Shelf would be granted by the Interior Department and state leases issued prior to January 1, last, would be exchangeable for federal leases. State leases issued prior to the effective date of the legislation would be validated and no accounting would be required to the federal Government of prior development and production.

In time of war the federal Government would have the first right to purchase the oil from the submerged lands.

The bill would recognize state title to lands beneath inland water, including bays, harbors, improvements, and filled-in lands, and the federal Government would recognize state grants covering piers, jetties, and other structures. The states, further, would specifically be given consent to bring suits in the Supreme Court to determine any claims against the United States to the submerged coastal lands.

Under the legislation, the states would be the agents of the federal Government with full power to manage, administer, lease, and develop oil and other natural resources in accordance with the state laws, as well as to handle grants for building and using docks, jetties, and other structures and to fill in areas in the 3-mile belt, subject to approval by the Army Engineers.

The states would be given a perpetual right to $62\frac{1}{2}$ per cent of the oil revenues within the 3-mile limit and $37\frac{1}{2}$ per cent of all revenues received by the United States from bonuses, rents, and royalties from the Continental Shelf.

Tidelands Plan Said to Provide Federal Control

THE latest proposal for compromising the tidelands issue would give the federal Government complete control of oil leasing on offshore areas though the states would share in the revenues, according to Bolivar Kemp, attorney general of Louisiana, who attended the conferences in Washington.

Kemp was quoted in Baton Rouge as saying that the plan gives the federal Government control and management of all oil and gas leases from inland waters seaward, though the states would be permitted to levy severance taxes on production out to the edge of the Continental Shelf, could police these waters, and would retain control over fish and marine life. Inland waters would be defined to include lakes, bays, harbors, straits, estuaries, and sounds, but not the open seas even within the claimed boundaries of the states.

He reported that the plan now calls for dividing the proceeds of leases with the coastal states getting $62\frac{1}{2}$ per cent of the revenue within the 3-mile limit and 50 per cent from leases farther off shore. However, the federal Government would drop its threat to demand an accounting and share of the proceeds of offshore leases since the date of the Supreme Court decision in the California case in 1947, and would permit the states to retain all revenues received up to January 1, 1949.

Another feature reported by Kemp is a requirement that federal leasing laws be amended to call for competitive bidding for offshore leases, as has been done with state leases. This would meet the criticism that oil and gas leases on federal lands frequently are obtained for small fractions of what would have been paid under competitive bidding.

Oil and Gas Conservation Theme of Compact Meeting

Theme of the summer quarterly meeting of Interstate Oil Compact Commission will be devoted to accomplishments of the states in oil and gas conservation. The meeting will be held at Stanley Hotel in Estes Park, Colo., September 1-3.

"It is the thought of the Compact's executive committee and those in charge of the program that people of the oil and gas-producing states and others interested in conservation should be informed as to what the conservation programs, conducted through the cooperation of the states and the industry, have meant to the people of the states and to the nation as a whole," the compact reported.

Clark, Patman Reported at Odds On Divorcement of Oil Industry

WASHINGTON. — A sharp difference of opinion over divorcement of the several branches of the oil industry was disclosed last week to exist between Atty. Gen. Tom C. Clark and Chairman Wright Patman of the House small-business committee.

While Patman was conferring with representatives of small business regarding the desirability of an investigation by his committee, which has no legislative powers, Clark told the House judiciary committee that the Department of Justice considered "divestiture, dissolution, or divorcement" as a last resort when monopoly can not be dealt with in any other way.

Clark indicated that the department distrusts divorce because it might leave the several segments of an industry in a bad position competitively and explained that where a monopoly is split up it is the policy "to have each of the parts remain a strong, independent enterprise, capable of competing and of holding its own in the struggle for business."

Movie Industry Cited

The only industry in which the Government has succeeded in divorcing production from other activities has been the motion-picture industry, where the Supreme Court held the producers and distributors of films should not own and operate theatres —the retail outlets of the industry. That case, however, pointed up one of the principal difficulties of divorcement, that of disposing of the facilities to be relinquished, it having proved very hard for the film companies to find purchasers for their theater chains.

Clark did not specifically discuss divorce as applied to the oil industry, but Sen. Joseph C. O'Mahoney of Wyoming, who followed him as a witness, discussed the oil situation at length.

O'Mahoney pointed out that following the dissolution of the old Standard Oil trust nearly 40 years ago a dozen or more companies sprang up, each of which is now larger than the original company.

O'Mahoney paid special attention to the Middle East situation, emphasizing that he was not speaking critically because the American companies are doing a "grand job," pointing out that four companies control the biggest oil deposit in the world, are in effect partners with governments, and sit in with governments in conferences relating to petroleum.

Clark also touched upon the oil situation when he said that monopoly seldom shows up in the form of one corporation dominating an industry, but usually is found in a small group of corporations whose collective power is so great that the entire industry must follow their lead.

"If one company makes a price cut or increase, the others follow," Clark said. "If a company manager catches himself thinking about increasing production in a way that might threaten the comfortable and carefully nurtured price structure of the industry, that thought is followed by the more persuasive thought the others might retaliate.

"In an industry in which monopoly power exists, those possessing that power can control prices by regulating production. When the price level in the industry produces satisfactory profits, there is no incentive to increase production. In a falling market, profits may be maintained by cutting production and employment rather than prices.

"In such an industry smaller producers may exist only by sufferance of those possessing monopoly power. Their position in the industry is fixed, and growing pains are quickly deadened by fear of antagonizing the 'big three' or 'big four.'"

Patman, meanwhile, is considering an investigation by his committee to determine where divorce is desirable for the oil industry, and has planned meetings with independent groups this week to discuss the matter.

Hearings Are Planned on Land-Leasing Legislation

WASHINGTON. — A House Public Lands subcommittee plans shortly to hold hearings on legislation which would require that leases for oil and gas development of government-acquired lands be issued only to the highest responsible qualified bidder by competitive bidding, the same as in the case of leases on the public lands.

The acquired lands are those taken by the Government by purchase or condemnation, no longer needed for the purposes for which they were originally secured. Under legislation enacted by the last Congress, much of the land has been turned over to the Interior Department for oil and mineral development.

Oil Industry Strikers Demand Welfare Fund

The Oil Workers International Union (C.I.O.) is demanding a royalty payment into a welfare fund in its strike in effect at the Oil City, Pa., refinery of Pennzoil Co.

The union is seeking, in addition to a wage increase, payment from the company of 5 cents per barrel of throughput into the fund, similar to that of the coal industry. The Pennzoil plant has been shut down since June 30.

Next Week

The Journal's Annual Midyear Report

will review the activities of the various branches of the industry during the first half of 1949—and look ahead at the probable developments during the last half of the year. How many wells will be drilled? What does the supply and demand picture look like? What are the trends in refining yields? What is the picture in the light-hydrocarbon field? What happened in foreign production? What about the natural-gas picture? What is the status of pipe-line, natural-gas-processing, and refining construction projects? What is the latest information on the import-export balance? If you are interested in any of these subjects, next week's Midyear Report is must reading for you.

Also

Engineering Reference Section

At this midyear point it should be beneficial for the industry's technologists to take a look at some of the recent engineering and research accomplishments in the different phases of the business, and to see what is representative of the work being done, and the trends pointed to the future. The forthcoming Midyear Engineering Reference section has been carefully designed to fulfill that purpose, and engineering and field and refinery workers will find therein a large number of detailed articles containing much interesting and practical material pertaining to drilling, production, field plants, refineries, and pipe-line transportation.

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STATEMENT OF CONDITION

June 30, 1949

RESOURCES

Cash and Due from Banks	$48,610,569.09	
U. S. Government Securities	68,559,488.59	
Other Bonds and Warrants	3,823,872.27	$120,993,929.95
Loans and Discounts		33,918,870.34
Overdrafts		2,499.58
Income Receivable Accrued		344,811.23
Prepaid Expenses		39,767.12
Stock in Federal Reserve Bank		180,000.00
Bank Premises		2,000,000.00
Customers' Liability Under Acceptances		65,274.00
TOTAL		$157,545,152.22

LIABILITIES

Deposits		$146,108,831.86
Acceptances Executed		65,274.00
Income Collected, Not Earned		132,896.96
Reserve for Taxes, Interest, Etc.		555,185.85
Dividends Declared*		150,000.00
Capital—Common	$3,000,000.00	
Surplus	3,000,000.00	
Undivided Profits and Reserves	4,532,963.55	10,532,963.55
TOTAL		$157,545,152.22

*Payable $75,000.00 July 15, 1949; $75,000.00 October 15, 1949

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MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

here's why the "SPIRAL-SET" pattern in CORE LAB Diamond Bits means more core cut per diamond, per revolution

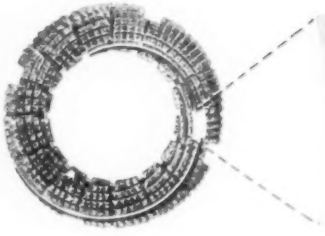


FIG. 1

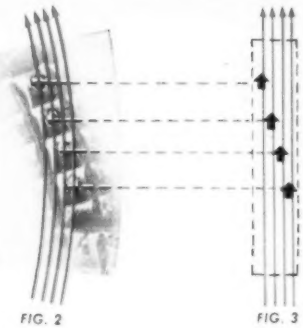


FIG. 2

FIG. 3

Maximum cutting efficiency (bit cost per foot) in Core Lab Diamond Bits is obtained by expertly selecting and handsetting each stone in a scientifically diagrammed spiral pattern (Fig. 1). This design, assuring that not more than half of the leading edge of each diamond will cut the formation, results in—(A) a smooth shearing of the formation, as compared to an inefficient bouncing action which occurs if the entire leading edge of each diamond is allowed to meet the formation pointblank; and (B) longer bit usefulness through controlled diamond wear.

In Fig. 2, above, the concentric arcs represent the travel path of the diamonds as the bit rotates, while the "Spiral-Set" pattern causes each diamond to assume a specific position with respect to adjacent stones and to carry a uniform "work load." The efficiency of the spiral pattern is further exemplified by direct comparison with the cutting principle of a gang plow (Fig. 3).

All Core Lab "Spiral-Set" Diamond Bits are manufactured with this same precisioned uniformity. Core Lab Diamond Core Barrels, incorporating both standard and improved operating features, *plus* Core Lab's field-proven reputation as one of the industry's top hands in *service*, add up to your best bet for Diamond Coring Equipment and Service.

"SPIRAL-SET"

CORE LAB

DIAMOND CORING EQUIPMENT AND SERVICE

For detailed information, prices, etc., write Core Laboratories, Inc., Box 5810, Dallas, Texas. Ask for illustrated "Spiral-Set" Bulletin.

CORE LABORATORIES, INC. ● DALLAS, TEXAS

DIAMOND CORING DIVISION

DALLAS HOUSTON CORPUS CHRISTI SHREVEPORT TYLER LAFAYETTE NATCHEZ
OKLAHOMA CITY DENVER MIDLAND ABILENE RANGELY WORLAND BAKERSFIELD

PERSONALS

Bridges Heads Humble's Gulf Coast Division

R. E. BRIDGES has been appointed superintendent of Humble Oil & Refining Co.'s Gulf Coast division, succeeding C. W. DeLancey, who retires this month after more than 30 years of service.

Bridges, formerly assistant superintendent of the same division, was born in Franklin County, Texas, and graduated from Texas A. & M. College in 1922 with a civil-engineering degree. He joined Humble in 1923 as a draftsman in the civil-engineering department, working in North Texas. He moved to Houston in 1924, specializing in field work in Mabank and Lytton-Springs areas. Transferred to the old Cisco division in 1925, the next year he became division civil engineer of the then newly created Amarillo Division.

Shortly after he returned to North Texas as division civil engineer headquartered at Wichita Falls, remaining there until August 1936, when he returned to Houston to become assistant division petroleum engineer of the Gulf Coast division.

He was named division petroleum engineer in 1939, and assistant division superintendent in August 1946.

Dr. William J. Peppel has been appointed director of Jefferson Chemical Co., Inc.'s new Austin laboratories, and **Charles H. Novotny** has been named manager. Dr. Peppel will be in charge of all technical activities while Novotny will be responsible for general management. Assisting Peppel will be **John W. Waldron,** assistant director of the laboratories and director of the process-development division; **Dr. J. David Malkemus,** director, products - application division; **Granville W. Burtt,** director, analytical division; and **Martin M. Padwe,** in charge of the library and abstracting division.

E. D. Lambeth, assistant production superintendent for North Texas, National Associated Petroleum Co., has been transferred to Fairfield, Ill., where he will serve in the same capacity in the East Illinois and Indiana areas.

Dave Moore, district geologist, is in charge of Superior Oil Co.'s new geological office for Wyoming, Montana, the Dakotas, and western Nebraska, which was opened recently in Casper, Wyo. Also on the staff are **Mark Guinan** and **Bob Smith,** geologists.

Richard N. Burnley, assistant department manager, chemicals division, at Shell Oil Co., Inc.'s Wilmington, Calif., refinery, has been transferred to the company's San Francisco office.

Thomas J. Hoff, chief engineer for Ajax Pipe Line Corp., at Racine Station, has been transferred in the same capacity to the Springfield, Mo., station.

Walter M. Cheney, drilling foreman for Shell Oil Co., Inc., at Ventura, Calif., has been promoted to drilling foreman in the Rocky Mountain division with headquarters in Casper, Wyo.

Earl W. Beck, formerly assistant purchasing agent in charge of foreign assignments for Socony-Vacuum Oil Co., Inc., has become assistant in charge of both domestic and foreign purchasing. He succeeds **Charles Roy Auster** who is retiring after 45 years with Socony-Vacuum. Beck joined General Petroleum Co. in 1923, became manager of purchases for General Petroleum in 1937, and was transferred to Socony-Vacuum in 1946.

Robert V. West, Jr., formerly on the technical-service staff at Humble Oil & Refining Co.'s Baytown, Tex., refinery, has joined the Slick-Urschel Oil Co., San Antonio, where he will be engaged with aspects of processing of light petroleum hydrocarbons, headquartered in Midland, Tex. West also served as research associate for Reconstruction Finance Corp.'s Office of Rubber Reserve on a special research project at University of Texas. He received his Ph.D. degree in chemical engineering from the university in 1949.

F. E. Powell has been appointed deputy general manager of the foreign-trade department, Socony-Vacuum Oil Co., Inc., and will be succeeded by **Robert Frothingham** as chairman of the foreign-trade committee. Other changes announced by the firm include: **Charles F. Darlington,** appointed representative for the company in London, succeeding **Victor Barry,** who is giving up the position due to ill health; **C. T. Crawford,** named assistant to the general manager and chairman of the planning group of the foreign-trade department, to be succeeded as manager of the supply and distribution division by **L. B. Davis;** and **H. K. Bowers,** appointed division marketing manager, White Eagle division, succeeding the late R. D. Mering.

Joe R. Wier, petroleum engineer for Trans-Gulf Development, Inc., has been transferred in the same capacity to New Orleans.

William Lawlor, Jr., Austin, Tex., vice president of Texas Public Service Co., has been elected a vice president of Southern Union Gas Co., following a merger of the service company into Southern Union. He will supervise operations for nine cities.

R. K. Tracy, former superintendent of the Galveston Bay district, Humble Oil & Refining Co., has been named assistant division superintendent, succeeding **R. E. Bridges,** who was appointed superintendent of the Gulf Coast division. Tracy has been replaced at Galveston Bay by **D. C. Rhodes,** former superintendent of the Lovell Lake, Tex., district, and **Joel C. Ott** was transferred to Lovell Lake from the Eucutta district. Tracy joined Humble in West Texas as a roughneck in 1928, and later served as junior engineer, a member of the gas division in Houston, district petroleum engineer, farm boss, and district superintendent at Magnet, Tex.

R. K. TRACY

T. H. Dwyer, mechanical engineer for Shell Oil Co., Inc., at Midland, Tex., has been transferred in the same capacity to the Houston regional office. Other changes include: **S. H. Rockwood,** reservoir engineer, transferred from Tulsa to Houston as exploitation engineer; **J. W. Inkster,** geologist, transferred from Tulsa to

PERSONALS

Houston; and **G. H. Calhoun,** division mechanical engineer, Houston area, moved to the Houston regional office in the same capacity.

N. VAN WINGEN

DR. N. JOHNSTON

Dr. Norris Johnston has been named president of the consulting firm of Petroleum Technologists, Inc., in Montebello, Calif., and **N. van Wingen,** professor of petroleum engineering at University of Oklahoma, has joined the company as vice president. Johnston formerly was with General Petroleum Corp. for 10 years as chief physicist in charge of production research, assigned to Socony-Vacuum Oil Co., Inc., to set up its Dallas production-research laboratories. Van Wingen was associated for 9 years with Richfield Oil Corp. in Los Angeles before joining the university's staff.

Thomas H. Jones, geologist for Carter Oil Co. at Mattoon, Ill., has been transferred to Denver in the same capacity.

Richard A. Given, chief process engineer for Cities Service Refining Corp., Lake Charles, La., has joined Petroleum Advisers, Inc., Cities Service Co. subsidiary, as process engineer in New York City.

Spencer W. Pitts, New York City, assistant to the president of J. M. Huber Corp., has been elected secretary of the company.

W. Greeven, former shareholder's representative of Standard Oil Co. (N. J.) at the Deutsch-Amerikanische Petroleumgesellschaft in Hamburg, Germany, has become an adviser in the company's New York offices. **W. R. Maddux,** former adviser for the North European area, has been named to succeed Greeven and has taken up his new duties in Hamburg.

A. N. Horne, Tulsa, has been appointed vice president and manager of foreign operations for Trans-Arabian Pipe Line Co. and soon will go to Beirut, Lebanon, where he will be headquartered. In the postwar period, serving as vice president of Texas Empire Pipe Line Co., he has been in charge of Texas Pipe Line Co.'s construction of the Basin Pipe Line System as well as Texas Empire's Patoka-Wilmington, Ill., project.

Ira Ball, former gang pusher for Sun Oil Co. at Belle Isle, La., has been transferred to the Conroe, La., district. **Marion H. Cayson,** inspector at Meraux, La., has been transferred to Crowley, La., and was replaced at Meraux by **Clyde A. Wherry,** district gager, formerly at Delhi, La.

M. L. Benedum, president of Benedum-Trees Oil Co., and pioneer wildcatter in the early days of oil development, was honored at a luncheon at the Duquesne Club in Pittsburgh on July 16, in celebration of his eightieth birthday, by a group of Pittsburgh oil executives. Benedum entered the oil business in western Pennsylvania and West Virginia as a land man for one of the Standard Oil Co. (N. J.) subsidiaries in 1895. He and **Joe Trees** later joined forces and were active for Standard Oil Co. (Ind.). They formed Benedum & Trees and wildcatted in Texas, Oklahoma, the Northwest, and in Mexico, Romania, and Russia.

M. L. BENEDUM

Frank Ball, production superintendent for Union Oil Co., Cut Bank, Mont., has been transferred to the company's Gulf Coast division. **Jim McCourt,** petroleum engineer, will succeed Ball as production superintendent, and **R. H. Higgins** has been transferred to Cut Bank from Wyoming to replace McCourt.

Shell Oil Co., Inc., production geologists from the east-of-the-Rockies territory at a recent meeting in Houston to discuss functions of the production geologist, a new manual of petroleum-geological engineering, and to review developments in subsurface geology in the various areas. Seated, left to right: A. P. Frey, Tulsa; E. V. Hanson, Houston; J. W. Watson, New Orleans; C. Wilhelm, regional; C. G. Cooper and S. W. Holmes, Midland; R. L. Ferris and R. H. Norton, Tulsa. Standing, left to right: S. Miron and J. M. Palmer, Houston; W. L. Wilgus and D. R. Dunham, New Orleans; C. F. Martin, Midland; E. W. Steffenhagen, New Orleans; G. Dickinson, regional; R. R. Echart and L. D. Hillyer, Houston; F. P. Van West, The Hague (group visitor); J. R. Fraser, Tulsa; M. T. Johnson, Midland; J. M. Fouts, Houston; B. Nanz, engineering and production research; and J. D. Milburn, regional

Newly elected officers of the Geophysical Society of Tulsa at a recent meeting devoted to planning program activities for 1949-50. Left to right: N. J. Christie, United Geophysical Co., second vice president; N. R. Sparks, Stanolind Oil & Gas Co., secretary-treasurer; W. T. Born, Geophysical Research Corp., president; and E. M. McNatt, Carter Oil Co., first vice president. The Tulsa group will cooperate in sponsoring a regional meeting with the Dallas section in Dallas November 17-18

R. E. Carraway, petroleum engineer, has been assigned to division headquarters of Standard Oil Co. of Texas, at Midland, as assistant to **Harvey Hardison,** manager. He formerly was located at Gainesville, Tex.

SHIFTS—

Louis L. Watson, Jr., geologist, U. S. Geological Survey, Tucson to Tombstone, Ariz.; **E. J. Hopkins,** superintendent, Rocky Mountain Drilling Co., Arvin to Bellflower, Calif.; **Joe A. Everitts,** superintendent, Ohio Oil Co., San Francisco to Bakersfield, Calif.; **N. E. Slick,** engineer, Tide Water Associated Oil Co., Ventura to La Crescenta, Calif.; **Charles H. Thurber,** engineer, Plymouth Oil Co., Cotulla, Tex., to San Antonio; **E. J. Kieth,** foreman, Continental Oil Co., Quanah to Plainview, Tex.; **George W. McMurry, Jr.,** engineer, Sun Oil Co., Schertz to Beaumont, Tex.; **Melvin Kaitz,** engineer, Pan American Production Co., Abilene, Tex., to Houston; **N. K. Moody,** foreman, Seismograph Service Corp., Amarillo, Tex., to Tulsa.

Joe C. Rolls, engineer, McClanahan Oil Co., Amarillo, Tex., to Gary, Ind.; **Jack L. Phillips,** geologist, Austin to Gladewater, Tex.; **L. A. Skinner,** superintendent, Superior Oil Co., Conroe, Tex., to Houma, La.; **Lloyd W. Madden,** engineer, Shell Oil Co., Inc., Corpus Christi, to Wichita Falls, Tex.; **W. A. Maley,** geologist, Humble Oil & Refining Co., Corpus Christi, Tex., to Houston; **Norman Ewbank,** engineer, Cities Service Oil Co., Houston to Midland, Tex.; **J. R. Montgomery,** engineer, Humble Oil & Refining Co., Houston to Tyler, Tex.; **John T. Miller,** superintendent, Baldridge & King, Inc., Laredo to McAllen, Tex.; **James B. Henry,** engineer, Stanolind Oil & Gas Co., Levelland to Lubbock, Tex.;

DEATHS

Charles F. Roeser, 61, president of Roeser & Pendleton, Inc., died July 14 in Fort Worth. A native of Marietta, Ohio, Roeser entered the oil business in early life, later going to Oklahoma where he was in the drilling business. From 1932 to 1934 he served as vice president of A.P.I. and from 1936 to 1939 he was president of I.P.A.A. He was also a member of the advisory board, U. S. Bureau of Mines, and chairman of the committee on petroleum and gas problems from 1936 to 1938.

Edward J. Bouwsma, 56, president of Commonwealth Pipe Line Co. and Old Dutch Refining Co., died in Holland, Mich., July 10. He was vice president of Michigan Oil Advisory Board and a director of the Oil and Gas Association of Michigan, and of I.P.A.A.

Allen Henry Flaherty, 37, Midland, Tex., associated with the firm of Flaherty & Sons, drilling contractors, died July 10.

James Collins, 62, Los Angeles, petroleum engineer, died in Yokohama, Japan, July 9. He had served with Tide Water Associated Oil Co. for 20 years and was on loan to Japan Oil Storage Co.

Andrew Johnson, 65, who helped develop the Dilworth field in Kay County, Oklahoma, and formerly with Sinclair Refining Co., died in Newkirk, Okla., July 15.

Edwin H. Hunt, 52, Calgary, Alta., Canada, manager of exploration for McColl-Frontenac Oil Co. and Texaco Exploration Co., was drowned July 10 in the Ghost River near Calgary.

George P. Whaley, former chairman of Vacuum Oil Co., died July 9 in New York City. He served as president of the firm for several years and was elected chairman in 1930.

A. W. Bowser, head of the legal and legislative section, American Petroleum Industries Committee, A.P.I., died in New York City July 14.

Lloyd C. DeHarte, former pipe-line superintendent for Hancock Oil Co. of California, died in Twenty-Nine Palms, Calif., recently.

Henry Lee Smith, 74, retired driller for Gulf Oil Corp., died in Sapulpa, Okla., July 17.

Harvey B. Landrum, 65, drilling superintendent for The Texas Co. before retirement last December, died in Pampa, Tex., July 8.

L. G. Greer, 68, retired construction superintendent for United Gas Corp., Houston, died July 5.

James Luther Marshburn, 32, Humble Oil & Refining Co., Jasper, Tex., died July 9.

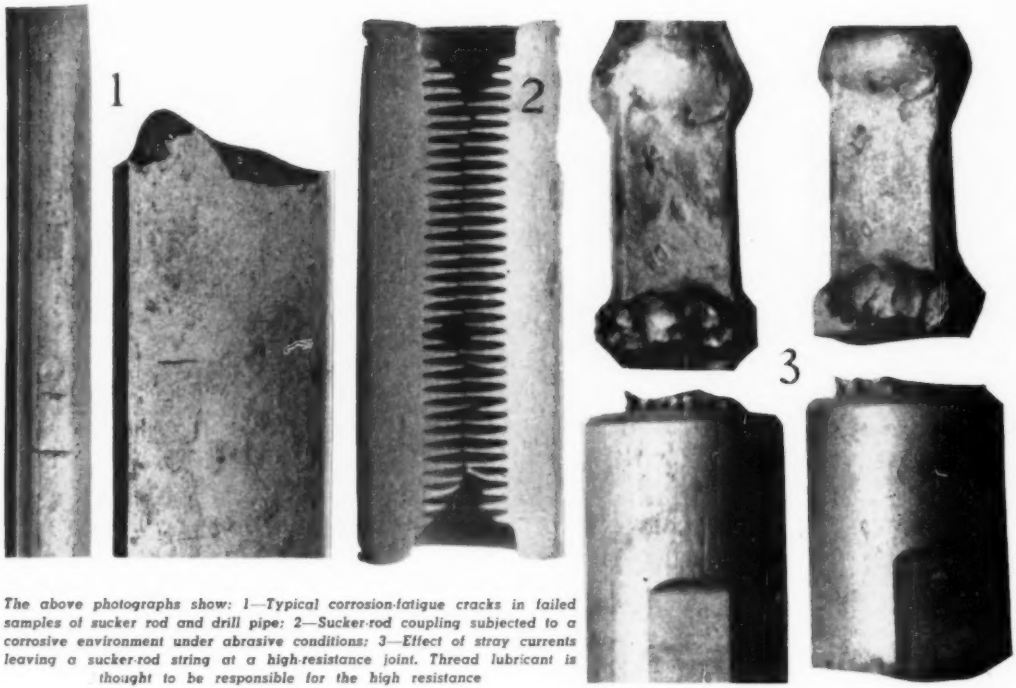
Bernard H. Georg, 47, gager for Warren Petroleum Co., Corpus Christi, Tex., died July 11.

John Sutton Cook, 45, district foreman for Pan American Pipe Line Co., Houston, died July 9.

Edgar N. Florsheim, 65, Monroe, La., who figured in development of Monroe gas field, died July 7.

Guy Everett Seward, 55, Duncan, Okla., for 20 years an engineer for Halliburton Oil Well Cementing Co., died July 14.

Wiley Joseph Hicks, Wichita Falls, Tex., linesman for Texas Pipe Line Co. since 1923, died July 13.



The above photographs show: 1—Typical corrosion-fatigue cracks in failed samples of sucker rod and drill pipe; 2—Sucker-rod coupling subjected to a corrosive environment under abrasive conditions; 3—Effect of stray currents leaving a sucker-rod string at a high-resistance joint. Thread lubricant is thought to be responsible for the high resistance

The Economics of Oil-Well

by Robert J. Villagrana* and William W. Messick*

PREVALENCE of corrosive conditions in certain wells may seem academic to production men who have wells being pulled once a week for holes in the tubing, or whose rod-string life is measured in a few weeks or months. Nevertheless, it is known that some degree of corrosion takes place in practically all wells and the problem simplifies itself into means of recognizing environments which may allow corrosion to reach costly proportions.

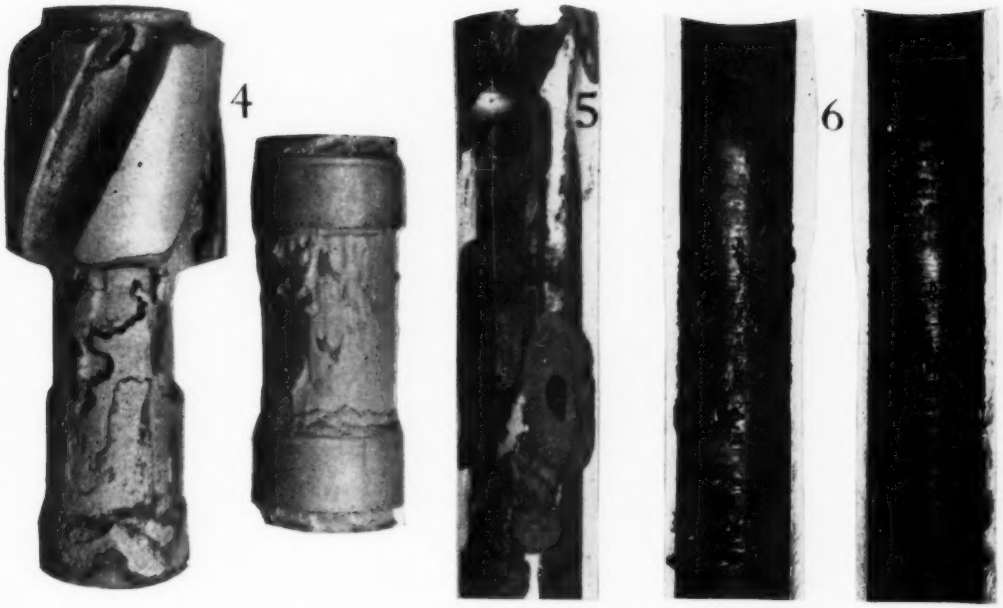
The most valuable yardstick for determining relative corrosiveness in oil wells is a good history of previous breakdowns and material replacements. There are many ways to record and keep the data from individual well breakdowns. However, it is not always possible to compile such a record; for example, in the case of a new well which develops corrosion trouble soon after being drilled. In such cases there are several other indications which may be used for predicting corrosiveness. None of these indications, it should be pointed out, have yet been sufficiently investigated to give an absolute answer, but most of them are useful in a relative sense. Some of these factors in environment, which alone or together may be used as a measure of oil-well corrosiveness, are as follows:

Nature of electrolyte.—Rate of oil and water production and percentage of emulsion cut appear to have definite relation to corrosiveness. We do not believe any direct correlation can yet be made, but these qualities seem to be functions of the efficiency of the well fluids as an electrolyte. An electrolyte is a liquid, which due to dissolved salts is capable of conducting a current. The opposition that an electrolyte presents to the passage of a given current is its resistivity. Low-resistivity fluids will allow electro-chemical corrosion to proceed at a faster rate than fluids of high resistivity.

It has been found that wells often become corrosion problems when the total water cut passes 85 per cent, although there seem to be occasional exceptions. Amount of emulsion carried in the well fluid will affect the fluid's resistivity and thereby the effectiveness of the fluid as an electrolyte. In general, therefore, large water wells with little emulsion should be relatively more corrosive than lower-cut wells with emulsion present.

Stray currents.—Such currents entering or leaving the well head through lead lines, or traveling from one formation to another, may give rise to electrolytic corrosion in tubing, rods, and casing. These currents, when passing through the well head, may be measured with a sensitive ammeter and have been found as high as 1 amp. or more. However, the value of such measurements should only be interpreted as a qualitative indication of danger, since the location and severity of the corrosion are not known.

*Standard Oil Co. of California, La Habra, Calif. Presented at A.P.I. meeting, Pacific Coast District, Division of Production, Los Angeles, May 12-13.



The photographs here show: 4—Hard facing alloy material on special-purpose couplings which caused galvanic corrosion of the base metal: 5—Plated pump plunger which failed due to galvanic attack concentrated at breaks in the plating: 6—Galvanic corrosion of 5 per cent nickel tubing concentrated at breaks in the mill-scale coating

Corrosion Control

H$_2$S content in gas or crude.—Hydrogen sulfide occurring in either gas or oil may constitute a corrosive environment if water and CO_2 or O_2 are present. Such conditions have not been noted in the scope of our location operations and so little experience can be reported on their effect.

Iron content of produced water.—The effluent water's iron content seems to be a fairly accurate check on corrosiveness. Most ground waters encountered in oil-bearing formations apparently contain very little iron. We have not been able to check on this accurately, but several wells in different fields treated with corrosion inhibitors show iron content reductions to less than 5 p.p.m. This would tend to indicate that ground-water iron content is very small. Thus it is hypothesized that iron content and volume of well fluid is indicative of the amount of metal being lost by the subsurface equipment.

Acidity of well fluid.—The temperature and pressure of the well, CO_2 content of the gas, and well-head pH are all indications, in a qualitative sense, of the acidity of the well fluid. It is generally believed that down-the-hole pH may be considerably lower than that found at the well head due to dissolved CO_2 and the resultant carbonic acid. It has thus far not been possible to actually measure down-the-hole pH, but some good work has been done by H. A. Carlson of Phillips Petroleum Co., who was able to produce in the laboratory pH as low as 4.1 at a CO_2 partial pressure of 80 psi.

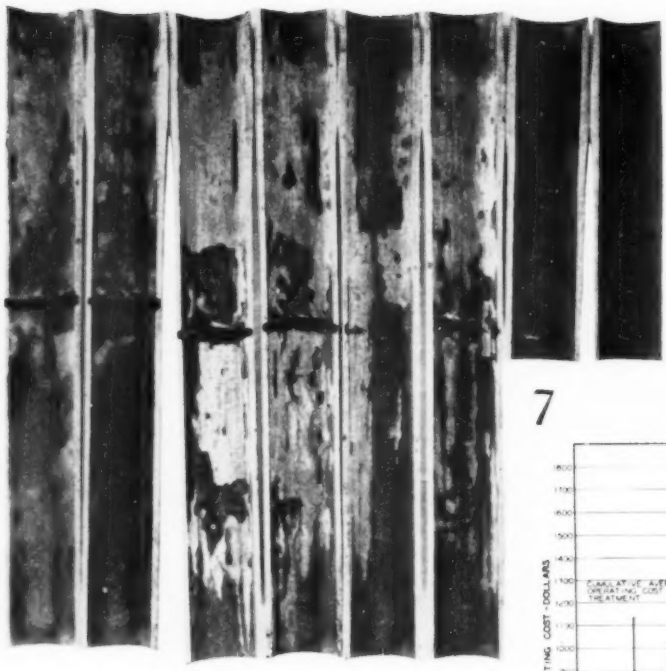
These general indications of corrosion will add up to a rather imponderable problem. However, when taken into consideration along with field observations of down-the-hole material and the breakdown history of a particular well, they may be of help in determining the best course of preventive action.

Types of Well Corrosion

Sucker rods operating under heavy cyclic load conditions in a corrosive environment are particularly susceptible to failure through corrosion fatigue. What is known of the mechanism of corrosion fatigue is ably reviewed by B. B. Westcott[1] of Gulf Research & Development Co., who points out that the net effect of cyclic stress and corrosive environment is greater than the sum damage that might obtain from either factor alone. Net effect of both factors is to increase the rate of crack propagation.

The cyclic stresses crack and tend to render less effective the naturally protective products of normal corrosion while alternate loading propagates cracks by the well-known mechanism of stress concentration. The actual severity of corrosion fatigue is mainly dependent on the type of corrosion present. A type of corrosion tending to form pits will cause rapid failure by corrosion fatigue, whereas generalized corrosion will not be so severe. Fig. 1 shows typical corrosion fatigue cracks in sucker rods and an example of the more familiar corrosion fatigue cracks in drill pipe is shown for comparison.

Sucker rods, sucker-rod boxes, and tubing are also subject to a severe combination of effects when operating in a corrosive environment under abrasive conditions. The rate of normal corrosion often slows down and



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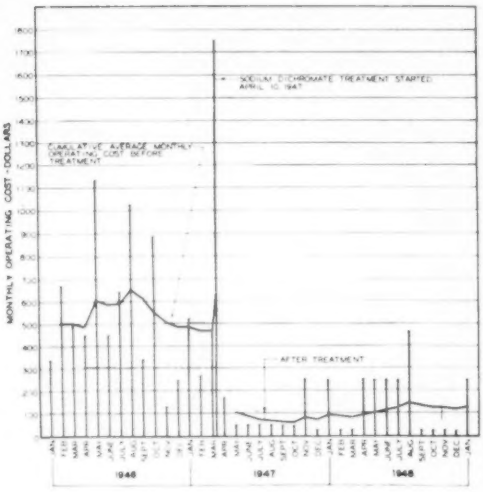


Fig. 7 (Above) shows galvanic corrosion of tubing due to differences in physical structure as a result of improper normalizing. Fig. 8 (Right) — Chart illustrating monthly operating costs of Well A before and after treatment with sodium dichromate corrosion inhibitor

may virtually stop as an obstructive layer of corrosion product is formed. However, where abrasion removes the protective coating, the corrosion will continue at its initial rate. This is often the case where sucker rods and boxes are in sliding contact with the tubing and is particularly pronounced where sand is being carried by the well fluid. Fig. 2 shows a rod box which has been subjected to corrosion under abrasive conditions.

Stray Currents Damaging

Stray currents traveling in a string of rods, tubing, or casing will often produce damaging effects. This is particularly true where the current leaves over a small area. For instance, the current traveling down a casing string may leave in a formation containing high salt content water as found by Ewing and Bayhi of Carter Oil Co.[2] Similarly, tubing and rod currents may leave at a contact point with other metal in a well or at high-resistance joints. Both of these conditions may result in holes with subsequent leakage. Fig. 3 shows a rod string which failed due to stray current leaving at a high resistance joint. In this case it was found that the thread lubricant had good insulating qualities and was thought to have caused the trouble.

When dissimilar metals in electrical contact with each other are exposed to an electrolyte, a current flows from one to the other and is called galvanic current. This current will cause corrosion of the more active metal of such a couple and is known as galvanic corrosion. The severity of this type of corrosion is governed by a number of factors, but several general rules may be followed to minimize the effect. Primarily, it is wise to avoid, wherever possible, the use of coupled dissimilar metals. Where they are necessary, it is desirable to have the area of the more active or anodic alloy large in comparison to that of the less active or cathodic alloy. Fig. 4 shows two examples of well material which have been damaged by galvanic corrosion. The examples are special rod boxes of standard rod-box material to which a hard facing of nonferrous alloy had been coupled. One box was designed to combat the type of wear shown in Fig. 1 and the other to remove accumulated wax on the tubing walls. Both boxes were unsuitable in service because the galvanic effect of the two coupled metals was not taken into consideration and the box itself was rapidly corroded in the vicinity of the bimetallic contact.

Nickel and chromium plating are also likely to result in galvanic corrosion of the base metal if the plating is not perfect. Fig. 5 illustrates a plated pump plunger which suffered attack where breaks in the plating due to porosity or mechanical abrasion exposed small anodic areas of base metal relative to much larger cathodic areas of intact plating. The base metal in such cases is subject to a pitting type of attack which may lead to early failure.

It is unfortunately not necessary to have dissimilar metals as such present in order to encounter galvanic attack. Tubular goods and rods covered with certain mill scales have been observed to suffer attack at breaks in the mill scale coating and apparently this is a galvanic phenomena. The area ratio here is often large as in the case of plating and may thus result in serious pitting. Fig. 6 shows a sample of 5 per cent nickel tubing thought to have failed from this cause.

Minute differences in physical structure will often result in galvanic attack. This effect can cause complete failure if concentrated at a particular point on a rod or tubing string. Trouble of this nature will often occur on tubing and rods that are not normalized over their full length after upsetting. Metal is rapidly removed by galvanic corrosion from a narrow band just beyond the upset (see Fig. 7) and is known as "ringworm corrosion." It has been found that these bands are softer than the metal in either the body of the pipe or the upsets and this difference in hardness or physical structure fur-

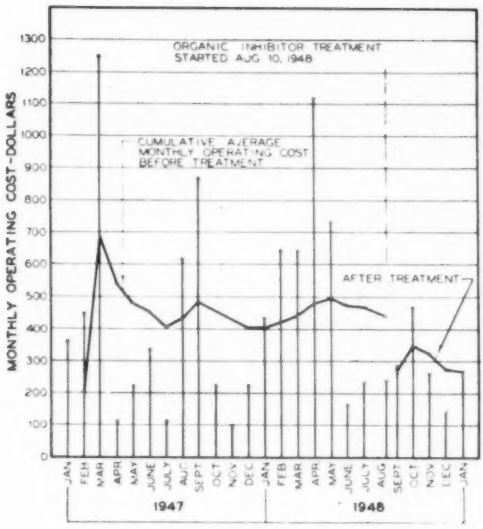


Fig. 8—Chart illustrating monthly operating costs of Well B before and after treatment with an organic corrosion inhibitor

nishes the necessary couple for galvanic action.

Evaluating Costs of Oil-Well Corrosion

The operating costs of a well which are influenced by corrosion may be thought of as being divided into direct and indirect costs. The direct costs are those accruing from the necessary labor and equipment for well pulling plus overhaul or replacement value of material retired. The indirect costs are the value of lost production and the cost of repairs necessitated by corrosion in gathering lines and handling facilities. In connection with lost production, it has been noticed that daily production averages have increased on some wells where breakdown frequencies have been reduced by successful corrosion control.

Periodic fluctuations of labor rates and material prices will affect all direct operating costs. Therefore, it would be difficult to evaluate exactly each pulling job over a several-year period on a particular well. For our purposes of establishing the approximate operating costs before and after some corrosion mitigation method has been started, average labor rates and material costs are considered adequate.

Two wells currently a part of our corrosion control program have been selected as examples to demonstrate the methods of cost evaluation used. Both of these wells are being treated with chemical corrosion inhibitors; well A with sodium dichromate and well B with an organic inhibitor. Figs. 8 and 9 are graphical presentations of the monthly operating costs of wells A and B respectively. The monthly cost figures are an evaluation of the breakdowns and material replacements plus the cost of corrosion prevention. Only the irreducible costs are included and no allowance for overhead is made. A cumulative average curve is superimposed on the monthly costs so that savings effected by the two corrosion-control methods are readily apparent. Fig. 8 indicates that monthly operating costs on well A have been reduced from $630 per month before treatment to $128, or a saving of $502 per month. Fig. 9 similarly shows that costs on well B have been reduced $165 per month. The relative reduction in cost before and after treatment is of greatest interest in these figures. The actual amounts are a function of particular material and labor costs and will vary from one operator to another.

A somewhat easier method of analyzing the economic progress of corrosion control on a well is by an analysis of the breakdown history. In this case, it is merely necessary to evaluate the reduction in breakdown frequency in terms of average well pulling costs and the reductions in various material replacements.

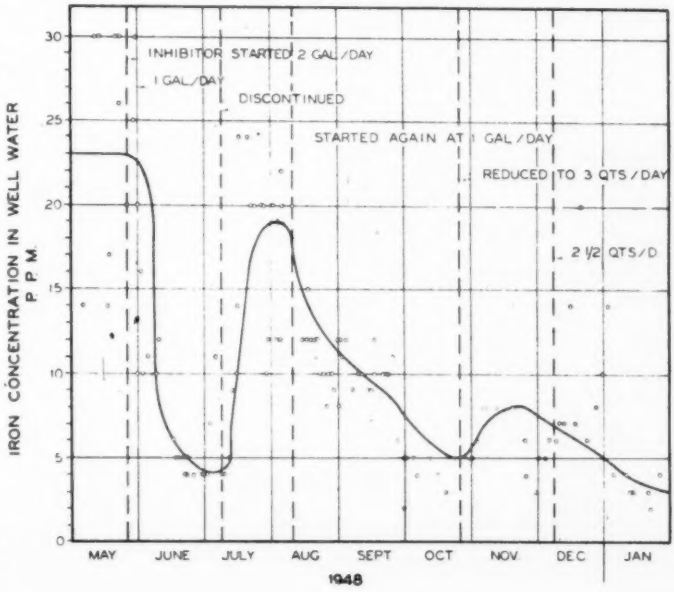
Corrosion Mitigation Methods Applicable to Oil Wells

Some of the best methods of corrosion prevention are in the nature of good practice and require relatively small original investment. One of the simplest and cheapest of these is the use of insulating devices between the well head and lead lines. Their function is to lessen the tendency for stray currents, picked up by surface lines, to enter or leave the well. Insulators should be aboveground and in such a position that currents cannot pass around them. It is also good insurance against trouble to inspect periodically and clean these insulating devices to preclude the possibility of accumulated dirt, oil, etc., from shorting current around them. Devices for insulating the rod string and preventing entry of stray currents via the pumping equipment are also available. At present, we have no definite information on the effectiveness of these insulators, but plan to initiate trials on them in the near future.

Another rule which should involve low first cost, but may prevent costly damage, is the avoidance of dissimilarities in oil-well materials wherever possible. As was pointed out in the previous discussion of galvanic corro-

(Continued on page 92)

Fig. 10—Record of iron content in effluent water from Well B before and after treatment with an organic corrosion inhibitor



Economics of
THERMAL REFORMING

by C. E. Feuchter

IN addition to octane improvement, thermal reforming is also an effective method for increasing gasoline volatility and is frequently employed to an extent greater than justified from strictly an octane improvement point of view. However, inasmuch as the economics of use of thermal reforming for increasing volatility must be compared with such diverse alternates as cutting cracked-gasoline end point, initiating a seasonal gasoline-storage program, or purchasing casing-head gasoline, this discussion has been limited to the octane-improvement phase of the process.

Straightrun gasoline is usually unsuited, without further refining, for use in modern high-compression engines because of its tendency to knock. By subjecting this gasoline to thermal reforming its octane number may be increased. However, in this process, a portion of the gasoline is converted into gas and residual fuel oil with a corresponding decrease in gasoline volume. The greater the reforming severity employed, the greater the octane number increase, but the greater the degradation of gasoline into less valuable byproducts.

Octane number of gasoline also may be increased by the addition of tetraethyl lead. On the other hand, as the quantity of TEL is increased, its relative effectiveness is decreased. For instance, the addition of 1 cc. of TEL per gallon of gasoline may increase the octane level of the gasoline by 10 numbers whereas the addition of a second cubic centimeter may increase the octane level only an additional 5 numbers.

Thermal reforming of straightrun gasoline is one of the common methods, besides TEL, for increasing octane number. While either method may be employed, it is usually economical for a refiner to use a combination of thermal reforming and TEL to meet octane specifications. This article outlines the manner in which the most economical combination of thermal reforming and TEL addition is determined, and illustrates the effects of product prices, TEL cost, and octane-number specification upon the economics of thermal reforming.

The author is with Pan American Refining Corp., New York. Portion of paper presented at recent Regional Meeting American Institute of Chemical Engineers, Tulsa.

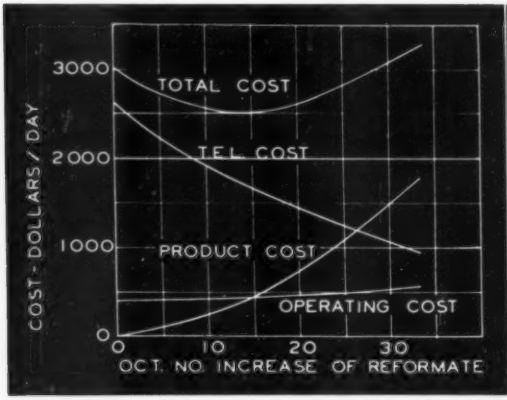
Optimum reforming level is determined by an economic balance between the cost of TEL required to reach specification octane level and the loss in yields sustained by thermal reforming. It is that reforming severity where the sum of the cost of the TEL, the decrease in value of products, and the operating cost of the thermal reforming unit is at a minimum.

Optimum Reforming for Hypothetical Refinery

Optimum reforming level will vary with the type of crude being processed as well as the type of processing equipment employed. To illustrate the method of determining the optimum reforming level, a hypothetical refinery processing 20,000 bbl. per day of East Texas crude oil is considered. It is assumed that this refinery contains a crude-distillation unit, a vis-

TABLE 1—ESTIMATED YIELDS AND GASOLINE QUALITY

	Bbl. day	Vol. % on crude
Charge:		
Crude	20,000	100.00
Purchased butane	170	.85
Total	20,170	100.85
Products:		
Straightrun gasoline	6,640	
Cracked gasoline	4,010	
Propylene polymer	100	
Purchased butane	170	
Total gasoline	10,920	56.4
Kerosine	2,000	10.0
No. 2 fuel oil	3,000	15.0
Bunker C	3,820	19.1
Gas (FOE)	900	4.5
Total	9,720	103.2
R.v.p. of gasoline		10 p.s.i.
Octane No. of gasoline—clear		67.2 C.F.R.-R.
Octane No. of gasoline + 1 cc. TEL gal.		77.7 C.F.R.-R.
Octane No. of gasoline + 2 cc. TEL gal.		82.4 C.F.R.-R.
Octane No. of gasoline + 3 cc. TEL gal.		84.8 C.F.R.-R.



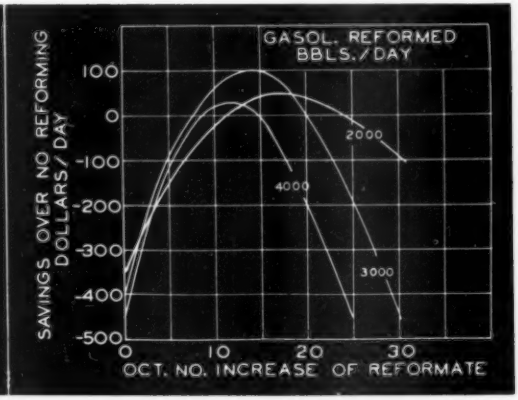
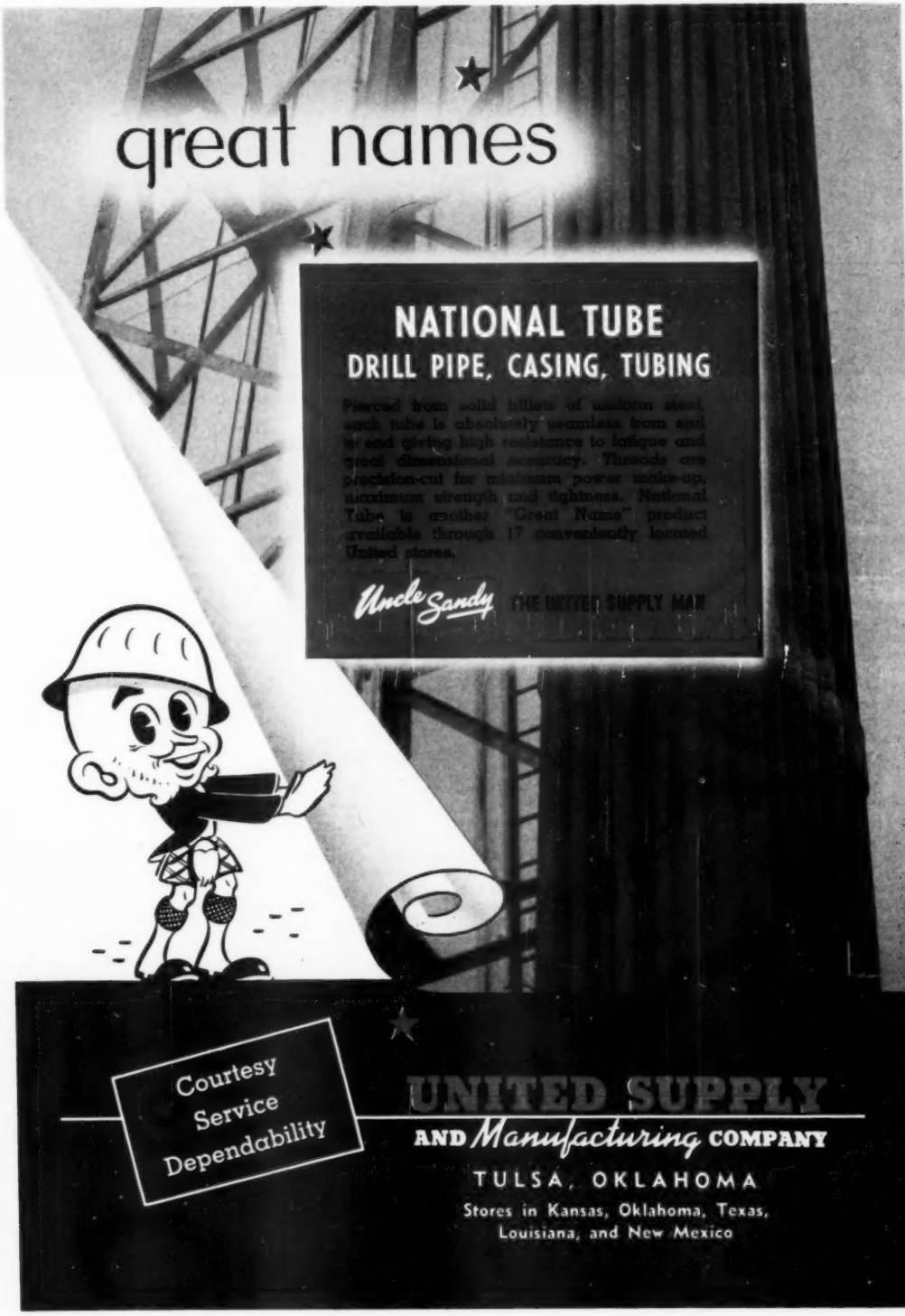


Fig. 1 (Left)—Cost of increasing octane number of gasoline to 84.0 octane number (research method) when reforming 3,000 bbl. per day of gasoline. Fig. 2 (Right)—Effect of quantity of gasoline reformed on optimum reforming level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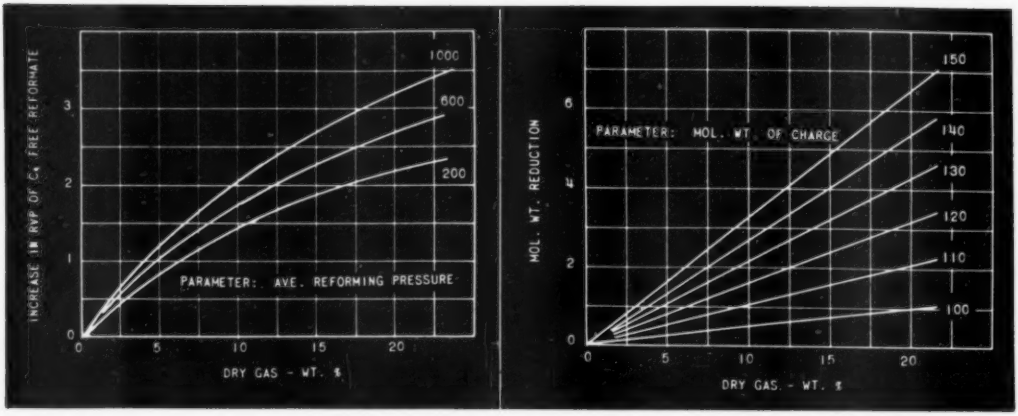

Fig. 3 (Left)—Increased R.v.p. of C_4-free reformate from thermal reforming. Fig. 4 (Right) Molecular weight reduction of C_4-free reformate from thermal reforming

breaking unit for cracking the reduced crude, a cracking unit for processing virgin gas oil and visbreaker gas oil, a catalytic polymerization unit, a thermal reforming unit, and a vapor-recovery system. Also the assumptions are made that the thermal reforming unit has sufficient capacity to charge any desired quantity of virgin heavy naphtha, that the average reforming pressure is 600 psi., and that the polymerization unit is large enough to handle the propylene produced together with a sufficient quantity of butylenes to reduce the Reid vapor pressure of total gasoline production to 10 psi. Kerosine and No. 2 fuel-oil yields of 10 and 15 per cent on crude respectively, are assumed.

Estimated yields and gasoline quality from the hypothetical refinery when reforming no gasoline are shown in Table 1.

As may be seen from Table 1, with no reforming it would be possible to blend an additional 170 bbl. per day of butane into the gasoline production without exceeding the 10 psi. R.v.p. specification. Inasmuch as the price of butane is usually below that of gasoline, it is usually profitable for a refiner to produce gasoline at the maximum allowable Reid vapor pressure by the purchase of butane. It also will be noted that the maximum octane number that can be obtained with 3 cc. of tetraethyl lead per gallon with no reforming is 84.8 (research method). It should be pointed out that thermal reforming increases the research octane number of gasoline to a greater extent that motor octane number and consequently the use of research octane numbers favors the economics of thermal reforming greater than would the use of motor octane numbers.

Fig. 1 shows the relative costs of TEL, product cost caused by gasoline degradation, operating costs, and total cost when reforming 3,000 bbl. per day of heavy naphtha at varying severities. These costs are based on meeting an octane-number specification of 84.0. The octane-number increase of the reformate, i.e., the difference in octane number between the reformate and the heavy naphtha charged to the thermal reforming unit, is used as the measure of reforming severity. For orientation purposes, when reforming 3,000 bbl. per day of heavy naphtha, a 5 per cent gas yield represents an octane increase of 16.8 units, a 10 per cent gas yield an increase of 25.7 units, and a 15 per cent gas yield an increase of 33.3 units. Obviously, the above relationship is not valid when reforming other quantities of heavy naphtha since as the quantity changes, its octane number changes, and the octane improvement for a given gas yield varies.

It may seem from Fig. 1 that as reforming severity is increased, TEL cost decreases whereas the product cost and operating cost increase. The cost passes through a minimum at an octane improvement of about 14.0 octane numbers. The increase in cost at higher reforming severity is caused by the fact that the increased gasoline degradation to less valuable byproducts exceeds the decrease in TEL savings. The total cost of approximately $3,000 per day at an octane number increase of zero is fictitious inasmuch as no thermal reforming unit would be operated under such a condition. Consequently, the total cost would be only the TEL cost of $2,600 per day. In subsequent illustrations, the savings above the base case of no reforming, expressed in dollars per day, are plotted against the octane improvement of the reformate. In other words, the TEL cost of $2,600 per day is used as the datum point, and any cost under this amount represents a savings whereas any cost above this amount represents a loss.

Costs shown in Fig. 1 are based on the following price structure :

Gasoline price, per gallon	9.5c
Butane price, per gallon	7.5c
Bunker C price, per barrel	$1.35
Gas price (fuel oil equivalent, per barrel ..	$0.425

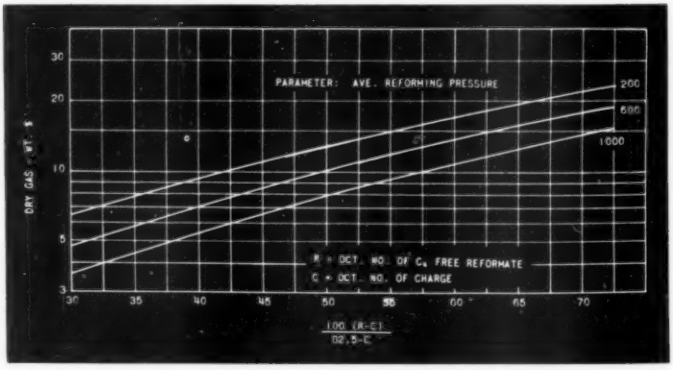

Fig. 5—Octane-number improvement (motor method) of C_4-free reformate

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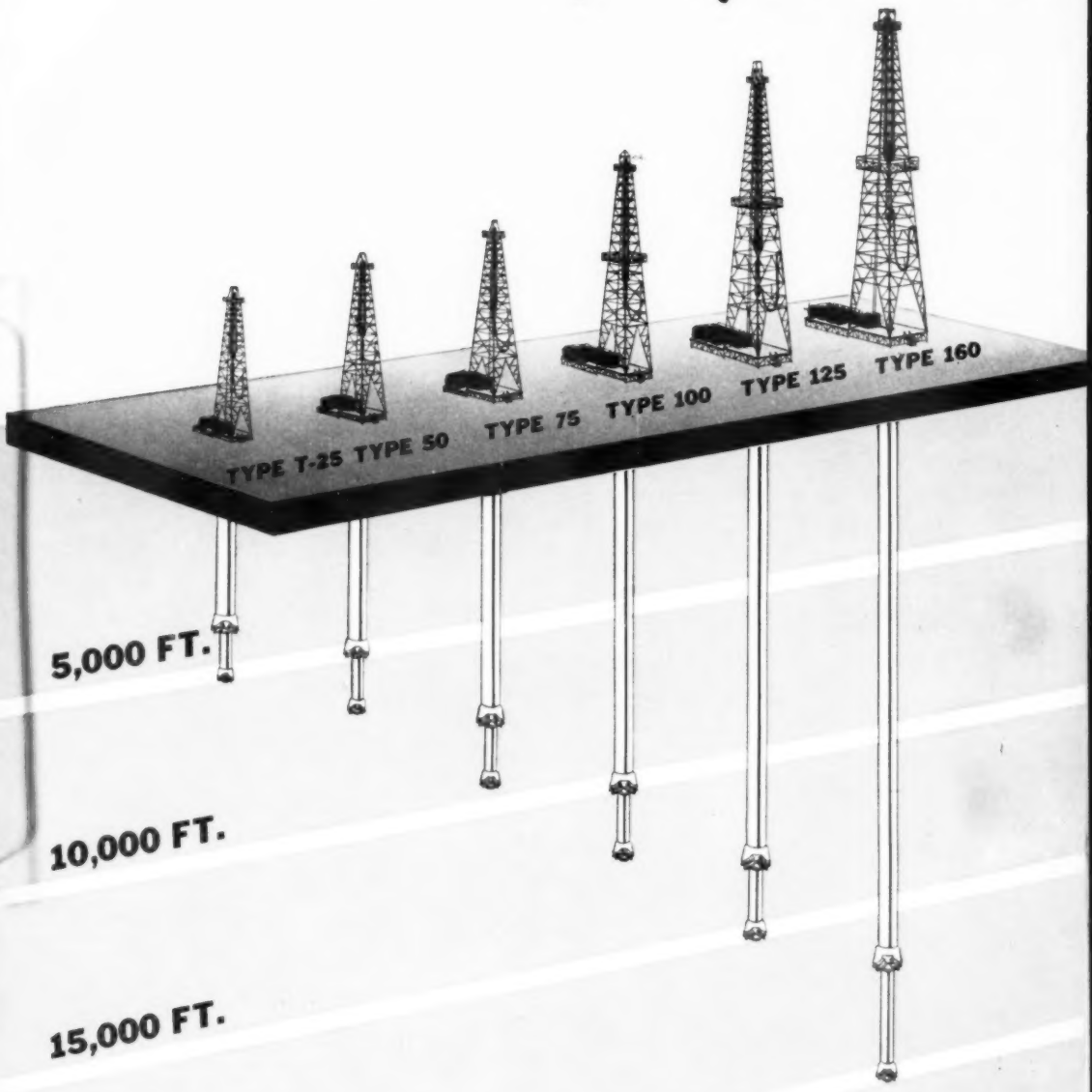

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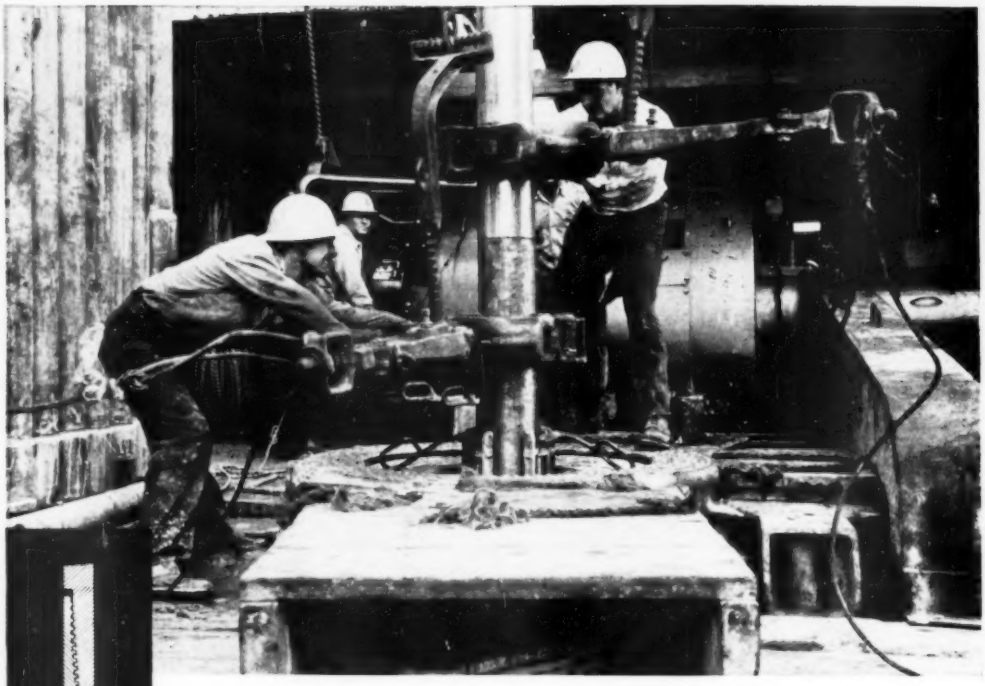

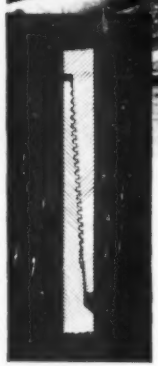

The broad rectangular Acme-type thread actually overcome the tendency of the threads to wedge apart like "V" threads.

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And here's why. The modified Acme-type thread has a very steep flank angle. This rectangular thread form provides a much better interlock than the ordinary V-type threads found on threaded and coupled casing because it overcomes the tendency of the mating threads to slide out of engagement under axial loads.

When a Spang Extreme Line Casing Joint is subjected to heavy axial loading, friction helps keep the joint together. The joint reacts to the load as a unit instead of tending to separate like the members of a threaded and coupled joint.

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May we send you a copy of the fully illustrated booklet, "Spang Extreme Line Casing"? It contains 20 pages of facts that point the way to reduced casing cost. Write for your free copy today.

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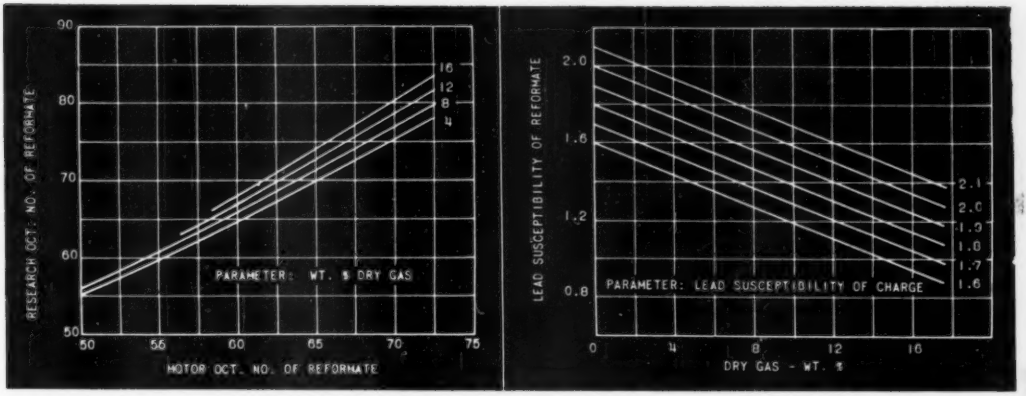


Fig. 6 (Left) Research octane number of thermally reformed gasoline. Fig. 7 (Right)—Lead susceptibility of thermally reformed gasoline

Cost of TEL, per cc. 0.215c

Out-of-pocket operating cost of the thermal reforming unit is the sum of a fixed charge of $250 per day for the cost of process labor and maintenance and repairs, an incremental cost of $0.05 per barrel of naphtha reformed for the cost of fuel, water, steam, electricity, and chemicals, and an incremental polymerization-unit cost of $0.50 per barrel of polymer produced.

Based on the same price structure as shown above, the effect of the quantity of gasoline being reformed on the optimum reforming level is shown in Fig. 2. The quantity of heavy naphtha is increased by decreasing the initial boiling point of the naphtha, which, in turn, results in an increase of its octane number. A charge rate of 2,000 bbl. per day represents a heavy naphtha having a boiling range between 300°-400° F. and an octane number of 41.9, a charge rate of 3,000 bbl. per day of heavy naphtha having a boiling range of 275°-400° F. and an octane number of 46.9, and a charge rate of 4,000 bbl. per day of heavy naphtha of 250°-400° F. boiling range and an octane number of 50.9. From Fig. 2 it will be noted that the optimum boiling range of heavy naphtha is that equivalent to a charge rate of approximately 3,000 bbl. per day of heavy naphtha. It also will be noted that with the assumed price structure of petroleum products, cost of TEL and octane level, the advantage to be gained by thermal reforming is relatively small. The profit of $100 per day at the optimum reforming level is equivalent to a net decrease in the cost of gasoline of slightly less than 1 cent per barrel.

Factors Affecting Optimum Reforming Level

While the economics of thermal reforming is not particularly attractive with the assumed price structure, the profits to be obtained are dependent upon many factors, including the competitive octane level, the prices of gasoline and butane, and the cost of TEL. The prices of the components entering into the determination of the optimum reforming level other than the primary variable were maintained the same as those used in Figs. 1 and 2. Also for simplicity, the effects of the variables are considered for a reforming rate of 3,000 bbl. per day. However, it should be emphasized that in actual practice, it is necessary to vary both the quantity of naphtha being reformed and the reforming severity for each set of conditions as was done in Fig. 2 in order to obtain the optimum.

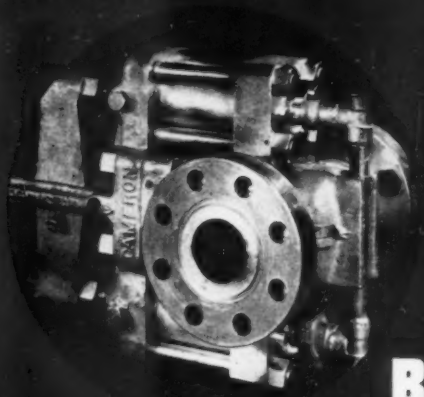
Thermal reforming is much more profitable at higher octane levels and the reforming severities for octane-number requirements of 86.0 and 88.0 are insufficient to increase the octane number of the gasoline to specification without exceeding the maximum limit of 3 cc. TEL per gallon of gasoline. For instance, in order to meet an octane specification of 88.0, approximately 5 cc. of TEL per gallon of gasoline will be required if no reforming were employed. It would be necessary to reform to at least an octane improvement of 20 octane numbers regardless of the economics of so doing in order to limit the TEL of the gasoline to 3 cc. per gallon. It also may be noted that as the octane level increases, the optimum reforming severity increases.

In calculating the effect of gasoline price, it is assumed that the price differential between gasoline and butane would remain constant at 2 cents per gallon. With a relatively low gasoline price such as formerly was in effect, it was possible to operate over a wide range of reforming severity and still be relatively close to the optimum level. On the other hand, with present-day gasoline prices, a relatively small change in reforming severity will result in a large change in profits. For example, with a 10 cents-per-gallon gasoline price, increasing the octane improvement from 13 to 25, equivalent to an increase of slightly over 5 per cent gas yield, results in a loss of about $350 per day. It is apparent, then, that operations must be watched much more closely today than formerly. A relatively small change in the cost of TEL has a large effect upon the economics of thermal reforming.

Effect of butane price on optimum reforming level indicates thermal reforming is considerably more attractive at a high butane price than at a low one. The differential would be considerably greater than shown if polymerization-unit capacity is taken into consideration. With a low butane price, it is economical to polymerize as much butylene as possible and to increase the gasoline Reid vapor pressure specifications by the purchase of butane. Since thermal reforming increases both propylene and butylene production, and in the event that the polymerization unit has insufficient capacity to handle the increased load, it would be necessary to blend butylene directly into the gasoline. This, in turn, will decrease butane purchases and will result in an economic differential between the high and low butane prices.

Up to this point no mention has been made of other processes, such as hydroforming and gas reversion, that are widely used for increasing gasoline octane number. A detailed comparison of the economics of these processes with thermal reforming is beyond the scope of this article. In general, however, in the case of both hydroforming and gas reversion, investment costs and operating costs are somewhat higher than those of thermal reforming, and it is possible to reform to a higher octane number. Consequently, as the octane level and price of gasoline increase, the economics of both hydroforming and gas reversion become increasingly attractive. Whether or not the increased

(Continued on page 94)



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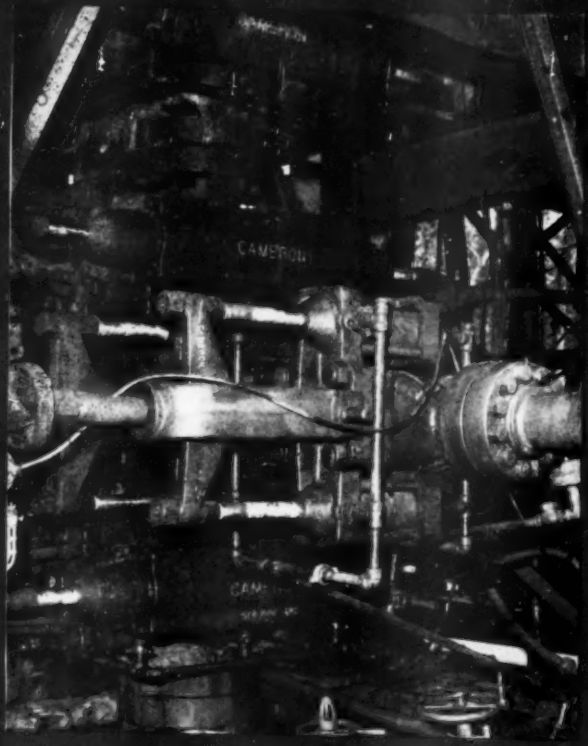

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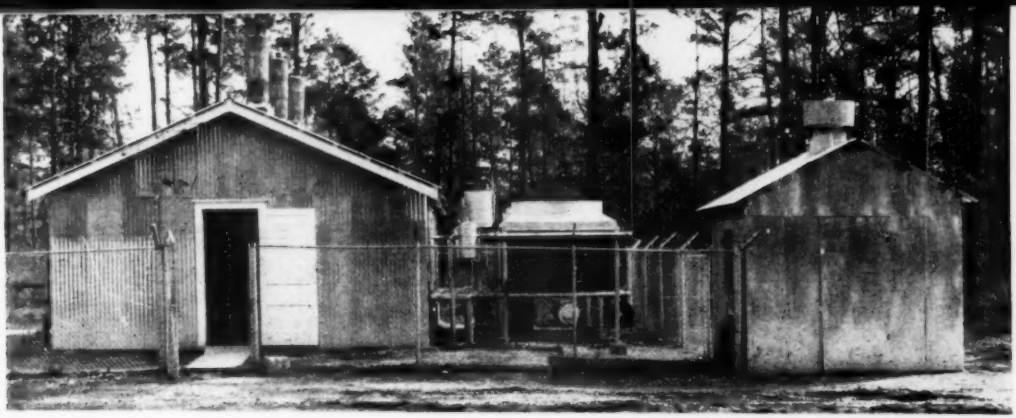
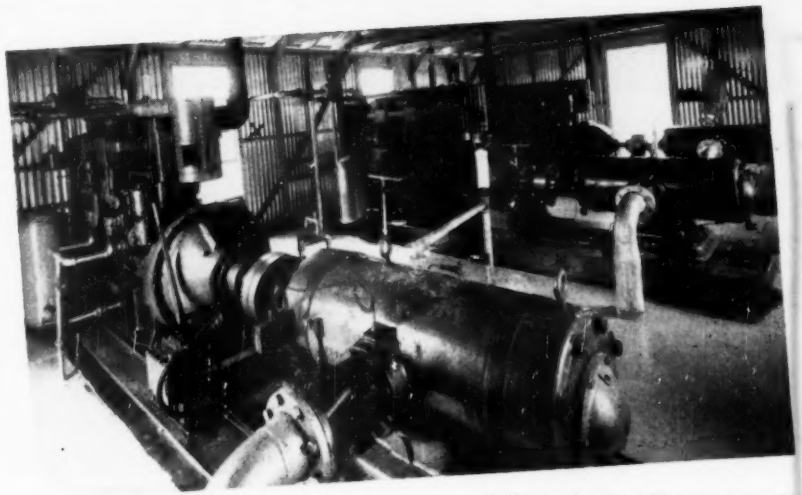




Above: Southern Carbon Co.'s gas-compressor booster, feeding to central compression plant at Fairbanks, La. From left to right appear engine house, coolers, and oil house. Right: Photo of the three gas engine-rotary compressors used in the installation

by

E. O. Hinton*

ROTARY COMPRESSORS

. . . for field booster service

THIS article is intended, primarily, to be of assistance to the operator and maintenance man and has to do with rotary compressors and high-speed combustion-engine drivers. A review of the installation and operating costs will be of interest to prospective purchasers of similar equipment, and a brief discussion of the solutions of a few specific operating problems might help someone. It is felt, though, that a few salient facts should be presented by way of introduction.

Several years ago the production department of Southern Carbon Co. realized the advisability of dropping the pressure on certain gathering systems that transport natural gas from some of the older producers in the Monroe, Louisiana, field. This became increasingly apparent with the demands of the war effort. Average pressures had fallen to the point where additions were needed to get a flow through the main lines to the central compressing plant at Fairbanks, La. About 4,000,000 cu. ft. was the daily load to be moved and compressors, rather than pipe-line reinforcements, seemed to be the solution.

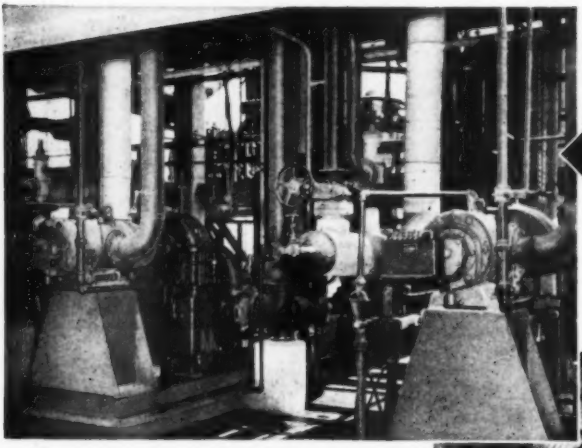
In casting about for available machines with which to accomplish the desired results the following factors were considered: the first cost of completed plant, the efficiency and flexibility of the units, the cost of operating labor, and the portability of the equipment. The last-named items were two of the deciding factors in the ultimate purchase of machinery. The removal and reuse of the plant might be necessitated by field depletions or by need of compressing units at some other point.

The resultant of the above was the purchase of three skid-mounted compressing units, each consisting of a C-135 Fuller rotary compressor direct coupled to a Climax R61 natural-gas engine. Each of the components has its individual radiator-cooled jacket-water system served by a belt-driven centrifugal pump. All the radiators for each unit are contained in a single unique and efficient vertical-draft cooler that utilizes a 56-in. flexible shaft driven fan to supply the cooling air.

Cost Breakdown

The accompanying photographs show views of the equipment. Each compressor is rated at 1,430,000 cu. ft. per day with 5 psig. suction and 25 psig. discharge. The plant was completed with company labor for an initial cost of $28,057.91, which includes the expense of factory supervision of equipment erection. A breakdown of the total cost shows:

*Repair supervisor, compressor station department, Southern Carbon Co., Monroe, La.

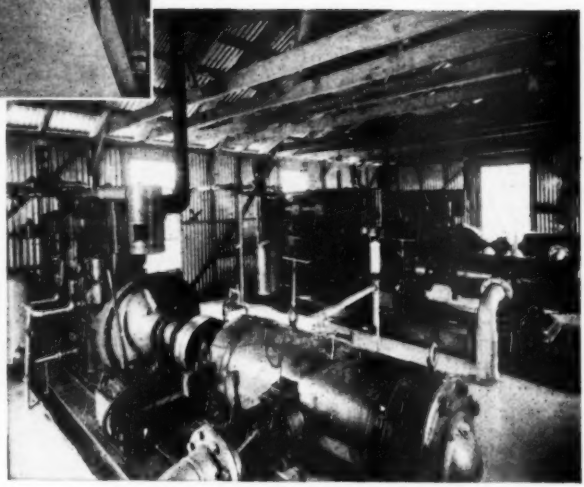


IN THE REFINERY

Two of six Fuller Rotary Single-stage Compressors in a refinery. Capacity each, 475 c.f.m., 45-lb. pressure. Turbine drive.

IN THE FIELD

FULLER ROTARY COMPRESSORS ARE EFFICIENT AND DEPENDABLE



Three Fuller Rotary Single-stage Compressors, applied to boosting of natural gas. Capacity each 1,430,000 cu. ft./24 hrs., from 5-lb. gage to 25-lb. Natural gas-engine drive.

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Small tools	5.62
Changes in pipe line	465.60
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Labor on above	1,177.08
Engineering and inspection (labor)	250.98
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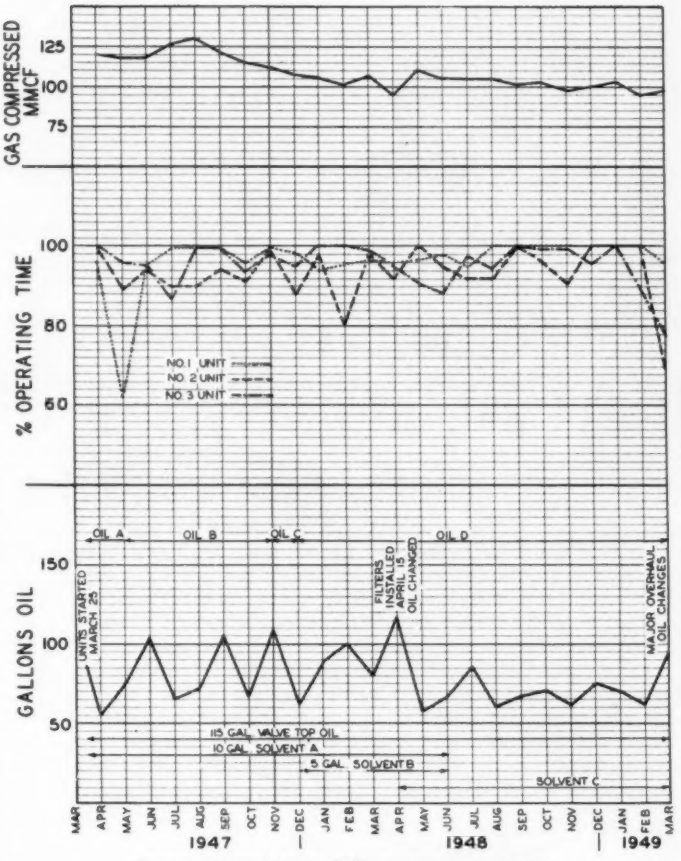
This completion cost compares very favorably with that of other types of compressing equipment. Each of the units weighs about 11,000 lb. complete with cooler. The plant was started and placed under load on March 25, 1947. Operation and maintenance were assigned to the compressor-station department.

The discussion of maintenance should be a better one if it were prefaced with a few remarks about some of the accessories that were supplied with the installation. The oil-cleaning device on each engine was a large sock-type filter that proved wholly inadequate to keep 15 gal. of crankcase oil clean under constant service at 800 r.p.m. (This department holds a close check on the neutralization number of oils in its engines that operate at speeds of 300 r.p.m. or more).

Success With Chosen Lubricant

An acid number of 0.4 has been arbitrarily accepted as the upper limit and filters are changed accordingly. A device that should be mentioned is a "normally open" sylphon valve that was placed in the engine jacket-water outlet. The reason for mentioning these items is that they were the offenders in some of the cases of continued trouble in operation. The compressor-station department, in 1939, definitely chose one particular lubricant and such a high degree of success was experienced with naphthenic oils that no other type is used in the heavy equipment. Several oils have been tried at this plant with no definite decision being made as to which type is best.

A graph is presented that gives one a study of exactly 2 years of operation under load conditions. It is intended that the running time be correlated with oil consumption. It is true that a goodly portion of the down time is not due to breakdown and the picture is a true story of normal operations. Some of the time out was called for well regaging, pipe-line repairs, and routine engine inspection. Most of the oil consumption "highs" were trouble spots, and down time shows up consistently. A brief chronology of the most difficult problems will be offered with the idea that someone might benefit therefrom by reading what not to do under similar circumstances.



Operational record for the field area compression station

The normally open sylphon was not the solution to water temperatures because there was no holding the water within a range of safe operations. A safety switch usually stopped the engine at the top of any reasonable differential. The valves were converted to "normally closed" by a few minutes machine work and with the manipulation of a bypass the inlet could be held close to 150° and the outlet to 165°. It was thought this range would be good to begin operations. A bypass was installed in the compressor outlet so that temperatures could be held more nearly constant during erratic weather conditions.

Misapplication of Lubricants

An annoying and expensive series of engine water-pump failures was traced to misapplication of lubricants. The waterproof grease was channeling and allowing the ball bearings to fail and ruin the seal. Discretion must be used in lubricating the pumps with the soft bearing grease that was substituted for the waterproof type. It would be possible, but not too easy, on this particular pump to force grease into the cooling system where it might prove troublesome. No evidence of over-greasing has been observed at this plant, and not one case of pump failure has occurred since the changeover.

Note that several different oils have been used since the initial kickoff of the plant. A good grade of valve-top oil has been applied through an oiler since the units were started. Mention was made of acid numbers, and the numerous changes of crankcase oil are due in a great part to this one item.

The initial charge of oil was a high-grade paraffin-base oil which possessed corrosion and water-resistant qualities. Next came a change to a popular automotive oil of about 30 S.A.E. body. That same month the No. 2 unit went down with exhaust valves stuck. A hard carbon deposit had built up in the recessed portion of the guides and galled the stems. Seven down periods within the first

(Continued on page 96)

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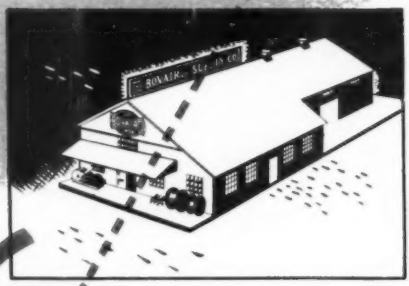

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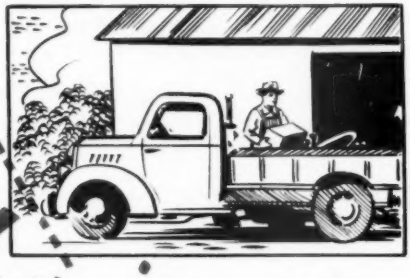

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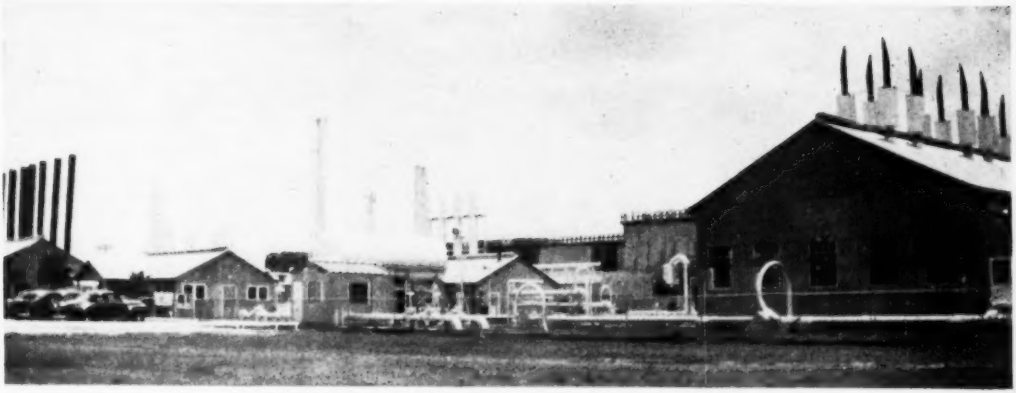


General view of Chicago Corp.'s Stratton-Agua Dulce field plant

Gas Handling, Conservation, And Reservoir Injection . . .

As performed by Chicago Corp. in Stratton-Agua Dulce field

by Roy A. Schuster* and Frank Jones*

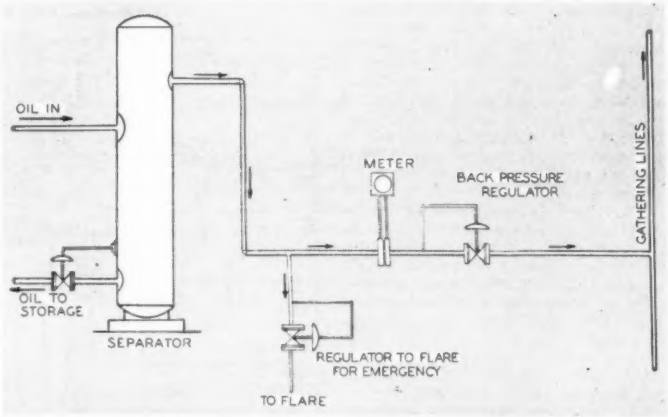
THIS paper discusses the recovery of casing-head vapors from oil separators, as operated by The Chicago Corp. in Stratton-Agua Dulce field.

The Stratton-Agua Dulce field contains about 55 sands. Some of the sands are dry gas, some distillate and two of the major sands, the Bertram and Wardner, are gas caps on oil-bearing sands. In order to conserve gas, to more fully produce oil and to effect a high recovery of the liquids in this gas cap, it was necessary to cycle these sands.

First section of the original plant was placed in operation about 10 years ago. This plant consisted mainly of a separator and compressors set in the plant yard. The gas was run into the separator where the distillate was recovered. The residue gas from the separator was compressed to the necessary pressure and returned to the formation through input wells. As time went on additions were made to the original equipment and by 1943 a complete high-pressure gasoline absorption plant was constructed, which recovered 85 per cent of the butanes and all the heavier liquids.

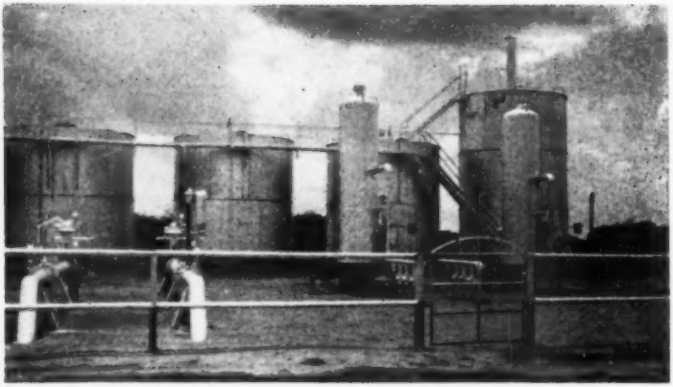
In 1944 pipe-line connections became available for the sale of gas.

*General superintendent of plants and engineer, The Chicago Corp., Corpus Christi, Tex. A paper presented before the fourth annual short course on oil technology, Texas College of Arts and Industries, Kingsville.



Schematic arrangement of field separator connections

The operations of the various gas sands were modified at this time. Gas from reservoirs which did not have to be cycled was commingled with gas from the Bertram and Wardner sands and treated in the plant. Part of the gas was sold to the pipe line and the remainder was recycled as required. At the same time that the gas was being cycled in these two



Field installation of separators and meter runs

reservoirs, oil was being produced from the same sand. All of the gas produced in conjunction with the crude oil was flared to the atmosphere.

As a conservation measure it was felt advisable to recover the flared gas, process it through the existing plant, and sell the residue to the pipeline companies. Construction was started on this project in 1944 and completed in 1945, the recovery system being placed in operation about the middle of the year. This recovery system was placed in operation over 4 years ago and was the first in this part of the state to be used in conjunction with cycling.

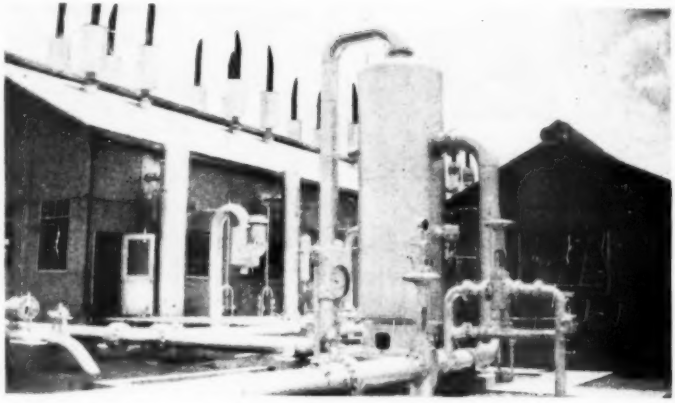
The compressors and field-gathering equipment which were installed by The Chicago Corp. were of sufficient capacity to process not only all of our own gas, but also to process most of the gas from two other companies. Later, due to the declining reservoir pressure, it became apparent that this flare gas should be returned to the reservoir, if pressure was to be maintained and a maximum recovery obtained from the oil and gas. Consequently, about 1 year ago the sales of this casing-head gas to the pipe-line companies was stopped and all of the gas is now being returned to the formation.

The original field-gathering system consisted of approximately 15,000 ft. of 10-in. pipe, 6,000 ft. of 8-in. pipe, 11,000 ft. of 6-in. pipe, and 10,000 ft. of 4-in. pipe. As the working pressure on most of the field separators being used was 125 psig., the field system was designed for a 20-psi. pressure drop, 100 psig. being maintained on the end of the line with 80 psi. at the inlet of the compressors.

The flare line from each separator was connected into the field-gathering system, the gas first passing through a meter run and back-pressure regulator. In addition each separator was equipped with an emergency regulator to flare, to properly release the gas should any trouble be encountered with the compressors. To handle the volume of gas involved from 80 to 1,200 psi. required approximately 1,400 hp. One existing 600-hp. engine was converted from injection service to casing-head service. One new 800-hp. engine was purchased and installed.

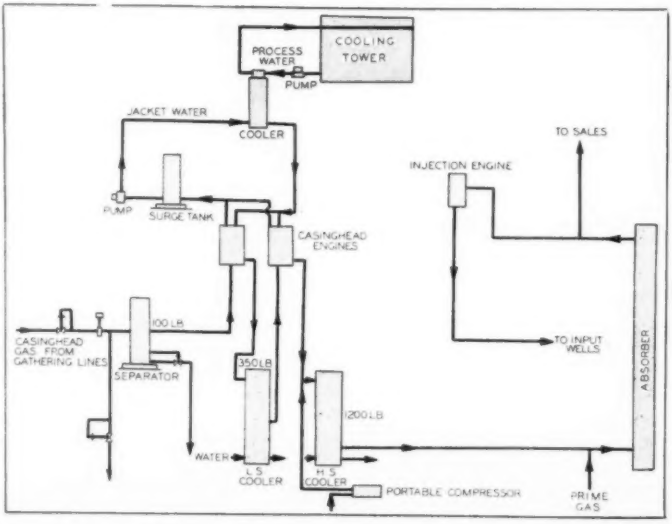
Casing-head gas enters the plant from the field-gathering line through a separator. Object of this separator is to catch any oil that might carry over. The separator is equipped with a high-level shutdown device which will shut down both engines in case the separator should fill up with oil above the float on the liquid level control.

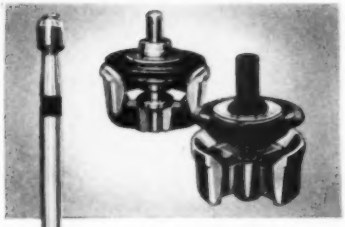
Prior to entering the separator the gas passes through a check measuring station, which is used for plant operation only and then through a regu-



Plant's separator is equipped with a high-level shutdown device and an emergency relief line

Flow scheme of the Wardner casing-head system





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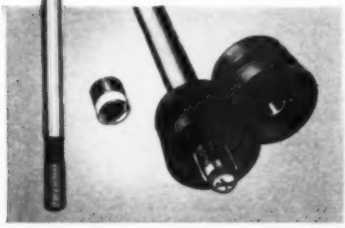

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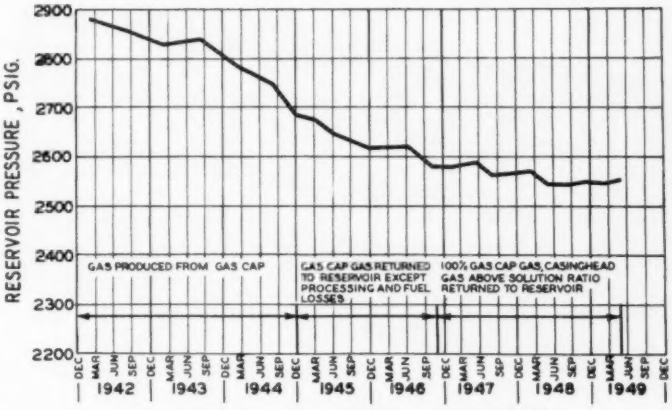
lator which maintains a constant pressure on the suction to the compressors. The separator is also equipped with a relief to flare for emergency shutdowns.

The gas is compressed in two stages to 1,200 psi., an inner cooler being used on the first stage and an after cooler used on the second stage. This cooled gas is then commingled with all the gas entering the main absorbers, and the liquid hydrocarbons are removed and processed along with the other liquids in the plant. The residue gas from the absorbers then enters the high-pressure injection engines where it is compressed to 3,000 psi. and then injected into the input wells along with the other gas being cycled.

At the time the 800-hp. engine was installed the existing water circulating pumps and cooling towers were being run at maximum capacity. This necessitated a small cooling tower being installed for cooling the jacket water on the new engine and also for cooling all the casing-head gas being compressed.

Separate System for Engine Jackets

As the process water is not only quite hard but also contains salt, it cannot be used for cooling the engine jackets. A separate system is used for this service employing condensed steam for the makeup water. This jacket water is inhibited with sodium dichromate against corrosion. The jacket water is in turn cooled in a shell-and-tube-type exchanger, the jacket water passing through the shell and the process water from the cooling-tower basin passing through the tubes. The coolers used on the gas inner cooler and after coolers are also shell-and-tube types, the process water being circulated through the tubes. The original installation was designed to handle 7,500 M.c.f. per day. More gas has become available and the capacity has been increased by increasing the suction pressure to 100 psi. and opening the clearance pockets on part of the compressor cylinders.



Pressure-performance curve, Wardner sand, Stratton field

A small amount of casing-head gas is also available from three batteries located in the opposite end of the field. Although this production is obtained principally from sands other than the Bertram and Wardner, it was felt advisable to recover these vapors. In order to handle these vapors a 150-hp. portable compressor was installed adjacent to the plant. Some of the existing field lines were used to convey the gas from the tank batteries, and a short discharge line connects this portable unit to the wet-gas lines entering the absorbers.

The portable compressor is a self-contained unit with separators and automatic shutdown devices, and employs a radiator for cooling the jacket water, lubricating oil, and gas. This unit has been in operation about a year and to date has given very little trouble. This compressor will handle slightly less than 1,000,000 ft. per day, from 100 psi. suction to 1,200 psi. discharge.

To better illustrate the reservoir performance in the Bertram and Wardner sands in Stratton field, it might be well to outline the general mechanics of the pressure-maintenance operation.

Every 3 months the operators in these sands conduct a cooperative bottom-hole-pressure survey from which isobaric maps are made and the weighted average reservoir pressures are established. Also, on a 3-month schedule, gas-oil-ratio tests are made on all the oil wells. From this data the solution gas-oil ratio is computed. (The solution-gas-oil ratio is the amount of gas in solution with the oil under reservoir conditions of pressure and temperature).

The solution-gas-oil ratio is set as the maximum amount of gas that may be produced per barrel of oil, and all gas produced over the solution ratio must be returned to the reservoir. The amount of oil that may be produced from each well is limited, then, only by the Texas Railroad Commission allowable (46 bbl. per day), the physical ability of the well to produce oil, and the ability of the operator to return all gas produced over and above the solution-gas-oil ratio.

Limit on Gas Wells

A limitation has also been placed on the producing gas wells in these sands. The maximum daily production for a gas well has been set as:

$$\frac{\text{Acres in unit}}{40} \times \text{top oil well allowable} \times \text{solution G.O.R.}$$

provided the acres in the unit do not exceed 640.

In order to further conserve reservoir energy, it was decided to close in the gas wells and produce their allowable in equivalent oil. For example: The daily gas allowable for a well in the South Bertram sand, having a 640-acre allocation, would be, for the month of May, the daily oil allowable of 46 bbl. per day times

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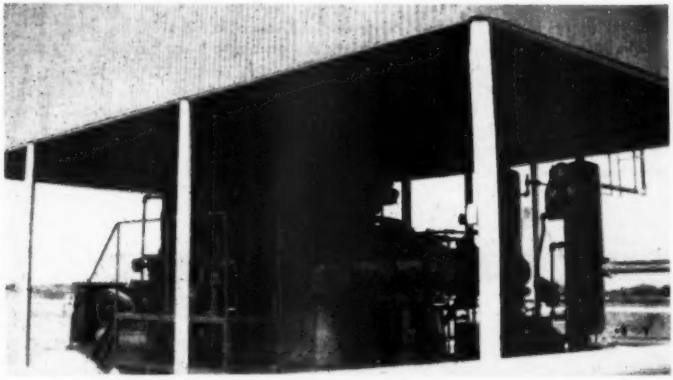

A self-contained portable compressor unit serves three batteries remote from the main field

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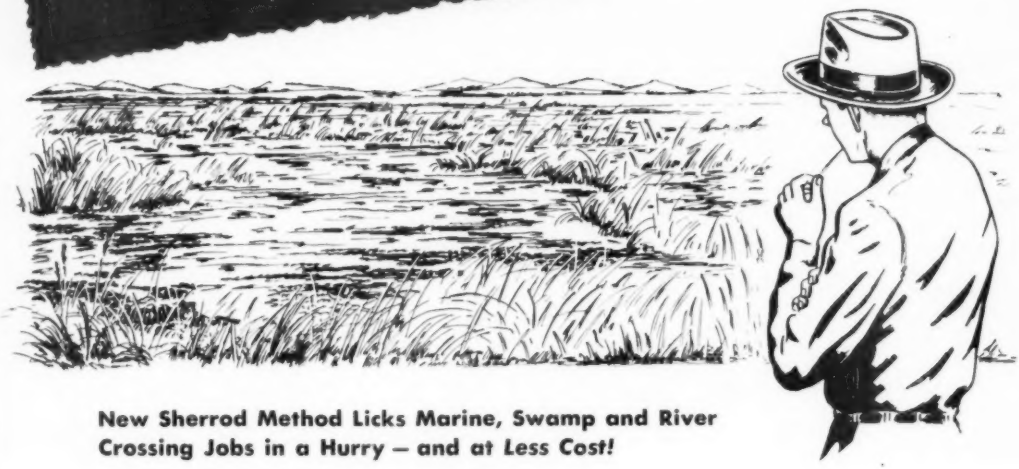

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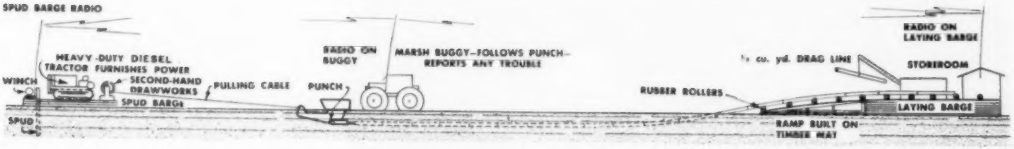
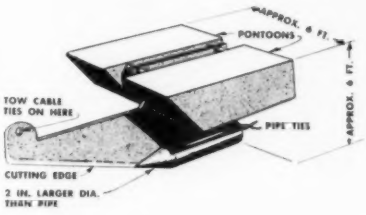
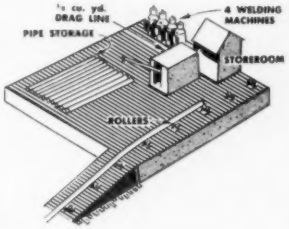


Schematic arrangement of equipment for pipe laying in swamps or marshlands by the Sherrod method. The device at right, called a punch, pierces the soil to form an opening through which is installed the pipe. At extreme right is shown a plan view of the laying barge where pipe sections are welded





New Pipe-Laying Method Expedites Marsh and River-Crossing Operations

by Leigh S. McCaslin, Jr.

A UNIQUE pipe-laying method designed to speed up and facilitate marsh operations and water crossings has been successfully used in the laying of 44,520 ft. of high-pressure line in the Gulf Coast area of Louisiana.

Developer of the method is B. L. (Buddy) Sherrod of Buddy Sherrod, Inc., pipe-line contractors of Conroe, Tex. Scene of the first operational test of the Sherrod Punch-Pull method was Bateman Lake field about 3 miles southwest of Morgan City, La., on the Atchafalaya River. The job was done under contract to The Texas Co., operators in the field.

Work performed included the laying of 44,520 ft. of 3, 4, and 6-in. Schedule 160 pipe for high-pressure producing and injection lines. Most of the lines were laid in typical Louisiana marsh terrain. In addition, it was necessary to install four company canal crossings (75-100 ft. wide), one Intracoastal Canal crossing (650 ft.), and one Atchafalaya crossing (1,428 ft.).

As an indication of the speed of the work using the Sherrod system, 1,670 ft. of 3-in., Schedule 160 (14.30 lb. per ft.) pipe was installed in 1 day. (Laying, ditching, and filling are done simultaneously under the Sherrod system). The crossing of the 100-ft.-deep and 1,428-ft.-wide Atchafalaya River was accomplished in 33 minutes. This is actual pulling time after the section was fabricated and tested. The pipe was laid on bottom—not buried.

Major equipment items used in the Sherrod Punch-Pull method (see drawing) are a punch, a spud barge, and a laying barge. The spud barge is positioned at one end of the line to be laid. The laying barge is placed at the other end. The punch provides the means of ditching and covering the pipe. The operation is not a cut-and-fill action in the manner of normal pipe-line operations—this will be explained later.

Punch Is Unusual

The punch is the most unusual piece of equipment in the setup. It consists of two steel pontoons to which are attached a large steel cutting blade and a torpedo or punch. In marsh operations, the pontoons are left empty and ride the surface. In water crossings, the pontoons are flooded with water, to eliminate the buoyancy, and ride the stream bed. The purpose of the cutting edge is to prepare the way for the punch and keep it running at the desired depth below the surface of the marsh or the stream bed. The punch makes a hole for the pipe being laid, the pipe being tied on behind the punch. This hole is one nominal size larger than the pipe being laid. This provides a water blanket around the towed pipe in the punched hole. Thus the action is much like that of towing pipe on top of water.

Because of this greatly reduced coefficient of friction, the load on the draw works is much less than would be the case if the pipe were in contact with earth or mud. For example, the Schedule 160 6-in. pipe used at Bateman Lake weighs 45.3 lb. per ft. Add to this 1 lb. for wrapping and coating and the total weight of the pipe, as laid, is 46.3 lb. per ft. By calculations it can be shown that the actual pulled load is only 5.92 lb. per ft., using the Sherrod method. This is assuming the pipe to be completely buoyant and the coefficient of friction to be 0.20.

The punch is pulled by a salvaged oil-field draw works which is mounted on a spud barge located at the terminus of the line being pulled. This draw works is powered by a heavy-duty diesel tractor. A 1240 sprocket (13-in.) is welded to the center of the Hyster winch on the back of a Caterpillar D-7 tractor. A chain drive connects to another 1240 sprocket (44-in.) on the jackshaft of the draw-works unit. Two thousand feet of 1¼-in. drilling line with a tensile strength of 130,000 lb. is used on the draw works. However, the length of pipe which can be pulled is not limited by the 2,000 ft. of line. Extra reels of line can be spliced on if necessary. Sherrod estimates that as much as 20,000 ft. of 6-in. Schedule 160 wrapped pipe can be pulled with this particular equipment setup. Longest pull on the Bateman Lake

This view of an oil worker sloshing through a Louisiana swamp shows type of terrain where the new pipe-laying method described here is employed

job was 4,610 ft. of 4-in. Schedule 160 pipe.

The height of the cutting edge on the punch, for the Louisiana job, was 15 in., thus burying the pipe to that depth. This measurement can be varied to comply with the particular specifications of a job. On one job, 10-in. Schedule 40 (43 lb. per ft.) pipe with 26-in. coverage was laid.

As a safety precaution, a marsh buggy and operator follow the punch on its course and spot any trouble. The marsh buggy is radio equipped and tied into both the spud barge and the laying barge. The radio equipment is frequency - modulated short wave.

Laying Barge

The third major equipment item is the laying barge which performs the function denoted by its name. Mounted on the barge are a $\frac{3}{8}$-cu.-yd. dragline, four welding machines, and a storeroom. In addition, pipe-storage space is provided, and rollers on which to move the pipe off the barge. These specially designed rubber rollers are an important part of the overall equipment. Sherrod attributes as much time saving to the rollers as to the punch. The rollers are designed to handle wrapped pipe up to 6 in. in diameter. They were fabricated by F. H. Maloney Co. of Houston.

Four welders work on the laying barge to fabricate the pipe into four-joint sections. There are sufficient rollers on the platform to handle the four-joint sections, plus an additional two joints if necessary.

A ramp is built off one end of the laying barge so that the pipe leaves the barge on a gentle slope. In addition, the ramp provides working space for the coating and wrapping of the pipe. Rubber rollers are placed on the ramp in line with those on the barge. This ramp is built on a timber mat.

It is interesting to note that under the Sherrod system the line being laid will follow the path of the pulling cable as it is laid on the surface of the swamp. In other words, the pull on the line is not strong enough to pull the pipe out straight. This permits detouring around obstacles and gives latitude in locating the line.

Theoretically, the punch will bury the pipe to the desired depth under conditions where the flexure of the pipe will fit it to the contour of the ground or stream bed. Where canals or streams are to be crossed, the approaches are dug out with draglines before the pipe is pulled across.

Welding time is a very definite limiting factor on the amount of pipe which can be laid with the Sherrod method. On the Bateman Lake job, the length of the laying barge restricted the number of welders to four. Welding the heavy Schedule 160, 6-in. pipe, the men could only make five welds each per 10-hour day. Hence, with the 30-ft. joints of pipe being used it was possible to fabricate only 600 ft. of pipe per day. The punch and pulling equipment is capable of handling much more line than this. If the welders had been working on regular 6-in. line pipe, the output would have been around 4,800 ft. per day.

Several interested engineers have asked what effect the Sherrod Punch-Pull method has on the pipe wrapping. To determine this, a check was made on the Louisiana job on a section of pipe which had been pulled 1 mile. It was found that the coating and wrapping were in as good condition as when first applied. In fact, this particular pipe had been factory coated and the kraft paper on the outside was not damaged in the least.

Field superintendent for Sherrod on the Bateman Lake job was M. B. Kidd. Supervising the work for The Texas Co. was Charles S. Harrel, maintenance foreman at Bateman Lake. A. B. Wardlaw is superintendent of gas and gasoline plants, Louisiana division, for Texas, and engineering of the job was handled by W. D. Yale, chief engineer, gas-gasoline department, Houston. Officers of Buddy Sherrod, Inc., are B. L. Sherrod, president; W. O. Baylor, vice president; Mrs. J. W. Sherrod, secretary, and O. Vittrup, treasurer.

As to the future, Sherrod believes that this Punch-Pull method has an application in offshore development work. He believes it offers an economical and expedient way of laying lines from offshore platforms to the mainland. This possibility is being discussed currently with a major oil company which has offshore production.

For this offshore work, the draw works would be set up on the offshore platform, and the pipe could be fabricated on shore or from a laying barge located at the shore teminus. The punch could be used on the sections of line which must be buried. (U. S. Engineer regulations require that pipe lines must be buried 3 ft. where water depths are less than 8 ft.). Where it is not necessary to bury the line, the punch could be removed and the line pulled into position by the draw works.

BOOKS

OIL! TITAN OF THE SOUTHWEST. By Carl Coke Rister. Published by University of Oklahoma Press. 467 pp. $5.

This is the exciting yet unbiased account of the rush for oil riches in the Mid-Continent and Gulf Coast producing areas, from the era of the Indians' oil springs through the blustery years of wildcatting to the recent more orderly, but equally dramatic, period of exploration and development. It is the story of the discovery and production of oil in this rich domain, which embraces the states of Arkansas, Louisiana, Kansas, Oklahoma, Texas, and New Mexico. It is more than a history of the development of an industry —it is a narrative of the men who have produced this important resources. It relates the rise of great corporations, the struggles of the independents, the adoption of scientific methods, and the emergence of controls. The volume will prove interesting to everyone from the tool pusher and driller to those whose only interest in and contact with the oil industry is a periodic visit to a service station. The book itself was written after nearly 4 years of research, financed by a generous grant by Standard Oil Co. (N. J.) to the University of Oklahoma Foundation, at which institution the author is research professor of American history.

QUESTIONS on TECHNOLOGY

by W. L. Nelson
Consulting Engineer

Mechanical Design of Heat Exchangers

Where can I find information on the design of flanges, plate, floating heads, etc., of heat exchangers so that I can design a condenser exchanger for a chemical plant? W.C.R.

The mechanical design of exchangers is so intimately related to the service or industry in which it will operate, the particular services encountered, and the limitations of shop or manufacturing operations, that no detailed outline of mechanical design should be expected in the literature. With regard to the general design of shells, headers, flanges, etc., not much of a problem arises because the design of such equipment is the common knowledge of mechanical engineers. Likewise, the generalities of hydraulics or paths of flow are well known to engineers. However, there are some features or practices that are unique to exchanger design and some of these will be mentioned below. In general, this knowledge is so specialized that it would be wise to rely upon the experience of exchanger manufacturers and buy an exchanger from them rather than to attempt the design and manufacture of an exchanger in some local machine shop.

The best source of information is the "Standards of Tubular Exchanger Manufacturers Association" (T.E.M.A., Tubular Exchanger Manufacturers Association, Inc., 366 Madison Avenue, New York). This publication standardizes:

Nomenclature	Shell diameters
Pressure	Materials
Cast iron (use of)	Eye bolts
Pressure tests	Baffle clearances
Alloys allowed	Baffle spacing
Tube length	Tie rods
Tube diameter	Gaskets
Tube thickness	Flange design

Tube pitch
Shell and cover thicknesses
Tube support plates
Tube-sheet thickness
Tube-sheet stresses

Many of the standard practices are covered by the A.P.I.-A.S.M.E. Code, and the materials are governed by A.S.T.M. specifications.

Each thickness and kind of tube requires a different thickness of tube sheet to insure that the joint will be leakproof. The temperature between adjacent tubes (or passes of tubes) is also important because too large a temperature difference will cause the tubes to pull loose or to fail. This is discussed in the T.E.M.A. standards, by K. A. Gardner in his "Heat Exchanger Tube Sheet Temperatures" (Pet. Refiner, March 1942, p. 59), and is mentioned in Petroleum Refinery Engineering, third edition, 1949, p. 487 (McGraw-Hill Book Co., Inc., New York).

The mechanical design of exchangers involves a thorough knowledge of their construction and uses, and hence the following general references, as well as the ones mentioned above are suggested:

1. Stauffer, F. B., Ten Steps in the Production of Heat Exchangers, Modern Industrial Press, October 1943.
2. Kopp, S., Heat Exchanger Design for Modern Processing, Pet. Engineer, June 1945, p. 108.
3. Sanderson, C. F., The Selection of Heat Exchangers, Pet. Refiner, February 1949, p. 150.
4. Rubin, F. L., Shell and Tube Heat Exchangers, Pet. Refiner, July 1948, p. 139.
5. Kopp & Farkas, New Design . . . Relieves Strain on Tube Sheet, Pet. Processing, June 1947, p. 449.
6. Nelson, W. L., Exchanger Types—Shell and Tube Bundle, The Oil and Gas Journal, February 9, 1946, p. 111.
7. Nelson, W. L., Types of Exchangers—Double Pipe, The Oil and Gas Journal, February 16, 1946, p. 129.
8. Nelson, W. L., Routing of Fluids, The Oil and Gas Journal, March 2, 1946, p. 91.
9. Nelson, W. L., Shells and Baffles, The Oil and Gas Journal, March 9, 1946, p. 93.
10. Nelson, W. L., Exchanger Tubes, The Oil and Gas Journal, March 23, 1946, p. 113.
11. Nelson, W. L., An Exchanger Design, July 20, 1946, p. 117.

Underground Storage of Gas

Would you please send me the names of any books or other literature that contain information on underground storage of natural gas?—D. B.

The nearest to a book is probably "Symposium on Natural Gas Storage," 1944, of the American Gas Association (420 Lexington Avenue, New York 17), and the association may have held several such symposiums. This booklet contains about 10 articles covering experiences in all parts of the country.

Another large source of information is Petroleum Bibliography No. 15 (December 1943, or its revisions) entitled, "Underground Gas Storage," which is distributed by the Tulsa City Library. This lists more than 80 references to articles dating back to 1926 or perhaps earlier.

A few more recent references are:

1. Anon., Casing-Head Gas Conservation by Reinjection at Rincon, Oil Weekly, May 12, 1947, p. 39.
2. Beach, F. K., Turner Valley, Alberta Natural-Gas Conservation Program, Oil Weekly, June 2, 1947, p. 17.
3. Bircher, J. R., Storage of Coke-Oven Gas in Sandstone Strata, Chem. Eng. Progress, 43, 453 (1947).
4. Claxton, Markle, and Meilert, Natural Gas Stored in Buried Pipe at 2,240 Lb., The Oil and Gas Journal, March 1, 1947, p. 60.
5. Fruechtenicht & Simpson, Underground Storage of Propane-Air and Natural Gas-Air Mixtures, The Oil and Gas Journal, June 2, 1949, p. 70.
6. Kubista, W. R., Flexibility of Underground Gas Storage Demonstrated, Oil Weekly, July 31, 1944, p. 22.
7. Meiller, D. V., Natural-Gas Storage in Underground Pipe Sections, World Oil, September 1948, p. 171.
8. Robinson, J. F., The Storage of Natural Gas, West Virginia Engineer, February 1944.
9. Todd, R. W., Underground Storage of Natural Gas, World Oil, August 18, 1947, p. 104.
10. Williams, N., Depleted Sands Provide Floating Gas Storage, The Oil and Gas Journal, June 1, 1946, p. 58.

Lubricating Wire Cables

What is the best way to lubricate wire rope or cables?—F. C. E.

Lubrication of old cables or ropes is never very effective. The cable is usually constructed of a hemp core which serves to hold the original lubricant, often petrolatum. Sometimes degras or pipe oil is mixed with the petrolatum. For a while the lubrication is satisfactory but in time the hemp core gets compressed into a hard mass by bending of the cable, and hence it does not function very well as a sponge for lubricant. Nevertheless, lubricant must be applied externally or the wire will rust and the cable will rapidly deteriorate.

Before the lubricant can serve its real purpose, it must penetrate into and between the strands where it can reduce the large friction between adjacent strands. Thus, the lubricant must be fluid or thin at the moment of application. If a heating bath is available, perhaps the best method of lubricating the cable is to melt a heavy residual petroleum oil and to pass the cable through the bath of hot oil. After the residual oil cools, it is a semisolid and it tends to stay inside the cable. Incidentally, if the cable is used where it can pick up abrasive grit or dirt, a sticky lubricant can aggravate rather than help the situation. If a heated bath cannot be provided, the hot lubricant can be brushed on the surface.

If the lubricant cannot be heated, then a thinner type of oil must be used, or perhaps better, a penetration type of oil can be employed. Residual oil dissolved in light cleaner's naphtha can be used, and some maintenance departments use beeswax dissolved in carbon tetrachloride. Penetrant mixtures flow between the strands and later the solvent evaporates leaving a film of lubricant.

Rock Shields Prove Economical In Protecting Pipe-Line Coating

by Paul Reed
Pipe-Line Editor

PIPE-LINE construction costs are being cut by eliminating the need for "padding," through a new practice initiated this year in the current construction of the 268-mile, 26-in. Clendenin, W. Va.-Rockville, Md. (Baltimore area), line of Atlantic Seaboard Corp. and Virginia Gas Transmission Corp. (subsidiaries of Columbia Gas Systems, Inc.). Instead of padding to protect coating of pipe laid in rocky ground, Kapco rock shields are wrapped and bound to the pipe preparatory to lowering in the ditch.

In the course of preparations by Columbia Engineering Corp. for building the Clendenin-Rockville 26-in. line, J. W. Overbeck, president, and H. S. Riddle, chief engineer, sought for an improved means of protecting coating of pipe laid in the rocky mountainous country of West Virginia. On finally adopting the rock shield method, authorization was given for using it for the entire coated section laid in rocky country. Installation in the field was supervised by M. G. Brant, construction engineer with Columbia Engineering.

Application of the Kapco method has been developed by Midwestern Engine & Equipment Co. using a pliable, hard mastic board made by Keystone Asphalt Products Co., which is "packaged" with special wood-fiber strapping material and equipment by Midwestern for pipe-line service.

After testing the possibilities of several methods and materials for binding rock shield, Midwestern has standardized on a procedure for applying the fiber band with a hand-operated machine by which four men apply two Kapco rock shield sheets in 1½ minutes. Such a sheet for 26-in. pipe contains 60 sq. ft. and is ⅞ in. thick. The binding tape has tensile strength of 510 lb.

Results of Tests

Tests of rock shield supervised by Brant at the initial installation in the mountainous Elkins W. Va., area where pipe was being laid by H. C. Price Co., showed that the coating was under severe treatment. Rocks of several sizes—from 6 by 12 by 2.5 in. to 17 by 8 by 4 in.—were dropped 5 ft. to hit the rock-shielded section in the ditch. Even though some of these penetrated the shield, inspection by electronic detector showed that there were no holidays in the coating.

Subsequently rock shield was applied in the western section of Columbia project contracted by Ray L. Smith & Son, Inc., near Clendenin, W. Va.

Total installed cost of rock shield is 35 cents per running foot including material, freight, and labor, on 26-in. pipe. In the West Virginia mountains padding would cost several times this amount. In many parts of the country padding commonly costs twice as

Applying the rock shields on 26-in. pipe being laid for Atlantic Seaboard Corp. and Virginia Gas Transmission Corp. in the Elkins, W. Va., area. The foremost man is Jack Glandon, of Midwestern Engine & Equipment Co. The man in the rear lifting a sheet of rock shield is J. E. Poole of Keystone Asphalt Products Co.

Left: Bulldozer backfilling pipe protected by cushion plate in rocky country of West Virginia. Above: Rock shield applied by laying over and under 26-in. pipe being laid for Texas Eastern Transmission Corp. by Associated Pipe Line Contractors, Inc., near Lancaster, Ohio

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much as rock shield applications. In sections of the country where rock-shield costs might be even slightly higher than the cost of dirt padding, the former method would still have advantages. This is by simplifying construction through utilization of a uniform material and a procedure which would eliminate operation of several dump trucks, a loading device, such as a high lift or power shovel, and 10 to 20 hand laborers.

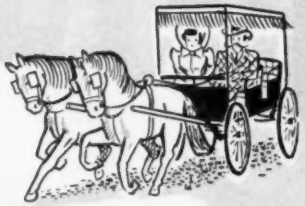
At the same time that the first rock shield was being installed for Columbia's 26-in. line to the Baltimore area, Associated Pipe Line Contractors, Inc., was applying this material as a substitute for padding in laying Texas Eastern Transmission Corp.'s 122-mile,* 26-in., Lebanon-Somerset, Ohio, loop. On this project the pipe-line company gave the contractor the option of substituting rock shield for padding. In contrast with the Columbia job, protection of coating was needed only occasionally because of the nature of the terrain.

The Columbia program for this line to Baltimore calls for protecting 53 per cent of the 268 miles of 26-in. Both this Columbia project and Texas Eastern's Lebanon-Somerset loop are being protected by application of coal-tar enamel and glass mat. For wrapping, the Columbia project uses asbestos felt while the Texas Eastern project uses kraft paper.

Success with which the method has already been used in recent weeks in rocky country has indicated so definitely the utility of this procedure that plans are being made by several pipe-line companies to use it for several other applications:

1. For wrapping coated pipe at river crossings instead of wooden slats or "snow fence" material.
2. For placing between pipe coating and river clamps at river crossings; also for saddle pads under hold-down anchors.
3. For protecting long coated sections pulled across swamps.
4. For protecting coated pipe pulled through casing at road crossings.

The rock-shield method, because of its uniformity and convenience, promises to bring important intangible economies of a kind which experience has shown increase contractors' profits wherever equipment and manpower may be reduced and closer supervision may be exercised. It has been estimated that there is a potential application of the method on 10 per cent of construction. At the present rate of building, approximately 10,000 miles annually, this could mean a possible rock shielding of 1,000 miles of these pipe lines. The extent to which the method may be utilized is indicated by the numerous applications initiated by pipe-line companies and contractors since the initial installations in West Virginia and Ohio on May 12 and 13.



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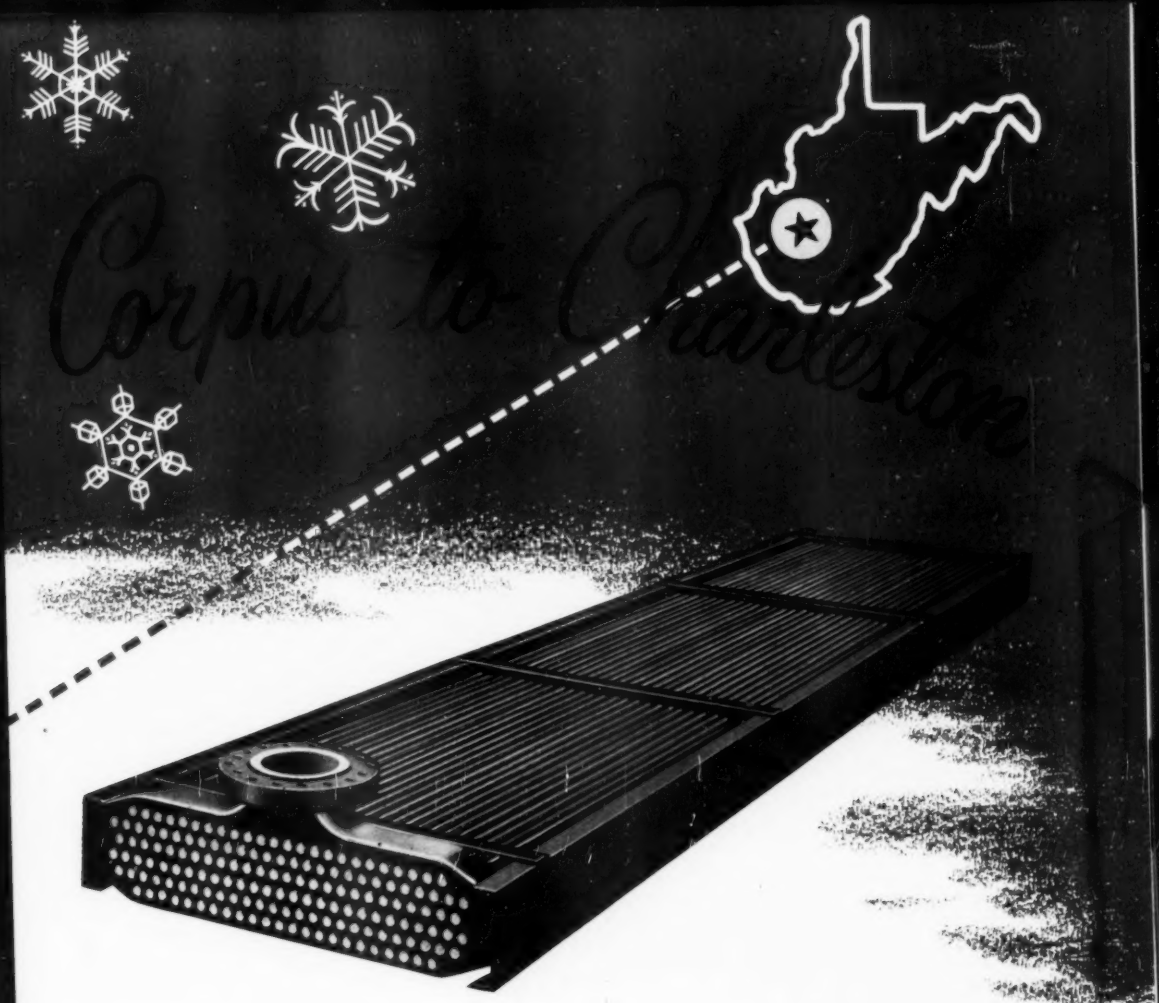

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Method of

Analysis of Absorber Oils

for calculating stripping and absorption efficiencies

by John V. Brubaker*

PRESENT-DAY operations in absorption-type gasoline plants necessitate a careful check on stripping and absorption coefficients. With the market for butane and propane increasing by leaps and bounds older plants are being rebuilt and new plants designed for the one main objective: higher butane-propane recovery. Since high propane extraction means exceedingly high lean-oil rates, it follows that the major investment and operating costs of the absorption-type plant are those involving equipment properly to strip and cool the lean oil. Incomplete stripping means that a higher oil rate is required to hold the same extraction efficiency of pentanes and lighter.

In all types of absorption systems, whether multiple absorption, flash flood, intercooler, or refrigeration, it is necessary for complete absorption of the pentanes-plus fraction to have the lean oil almost completely stripped of pentanes. This is governed to some degree by the oil rate, which in a plant designed for high propane retention is much higher than that required for complete absorption of pentanes, thereby lowering the amount of stripping necessary for the 100 per cent retention of pentanes. An optimum stripping coefficient can be found, and operating conditions set to maintain this coefficient which will tend to keep ethane-methane extraction to a minimum, since the higher the oil rate the more ethane-methane absorption.

After a new plant is designed, built, and placed in operation with the absorption system operating under design conditions, it is then necessary to experiment to determine the most economical and efficient conditions under which to operate. A complete analysis of lean oil and fat oil is highly desirable for this determination. The operating conditions will vary with changes in cooling water, temperature, gas content, gas volume, etc. To meet these changes the lean-oil analysis should be continued at regular intervals.

Since a large percentage of plants use an oil reclaimer to keep the condition of the lean oil suitable by controlling the end point of the oil, an accurate check on reclaimer efficiency can be had by running a distillation† on the depentanized bottoms obtained from a low temperature fractional distillation. A typical analysis on lean oil is given in the accompanying table.

TABLE 1—TYPICAL ANALYSIS ON LEAN OIL
Weight percentage, water and hydrogen sulfide free

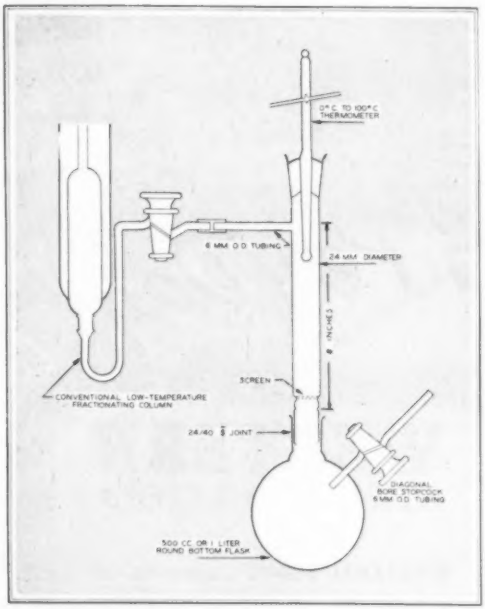
Methane	0.038
Ethane	0.008
Propane	0.013
Isobutane	0.064
N-butane	0.118
Isopentane	0.098
N-pentane	0.061
Hexane plus	99.600
Total	100.00

An accurate method of analysis now seems to be a must in the modern plant. The method outlined here is presented as such and appears to be far superior to either the distillation or vapor pressure method. The apparatus described herein‡ permits the use of a lean oil or fat oil sample sufficiently large to provide measurable quantities of pentane and lighter gases for distillation in an ordinary low-temperature fractional distillation column, and at the same time providing sufficient depentanized bottoms for checking reclaimer efficiency.

Auxiliary Still

The accompanying figure illustrates the auxiliary still which may be used in conjunction with any low-temperature fractional distillation column having a still body of 20 ml. capacity or more. Before an analysis, the column of the auxiliary still is filled with sodium hydroxide pellets to form the packing, and pellets are placed in the flask to act as boiling stones.

The entire system is evacuated to a pressure of less than 1 mm. of mercury, by means of the pump regularly used with the gas-analysis equipment. The reflux condenser of the low-temperature column is cooled below the boiling point of methane, and a Dewar flask containing acetone and dry ice is placed around the inlet tube of this column. Liquid nitrogen may be used here for a safety precaution. The lean-oil or fat-oil sample bomb is then connected to the inlet stopcock of the auxiliary still, and sample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DIAGONAL BORE STOPCOCK 6 MM. O.D. TUBING
500 CC. OR 1 LITER ROUND BOTTOM FLASK

Auxiliary still employed with low-temperature fractional-distillation apparatus for laboratory analysis of absorption oil

*Assistant superintendent, Pure Oil Co., Van, Tex.

†Standard Method of Test for Distillation of Gasoline, Naphtha, Kerosine, and Similar Petroleum Products, A.S.T.M. Designation: D86-46, A.S.T.M. Standards 1946, Part III-A, page 155.

‡Askevold, R. J., and Agruss, M. S., Ind. Eng. Chem. Anal. Ed. 17, 341 (1945).

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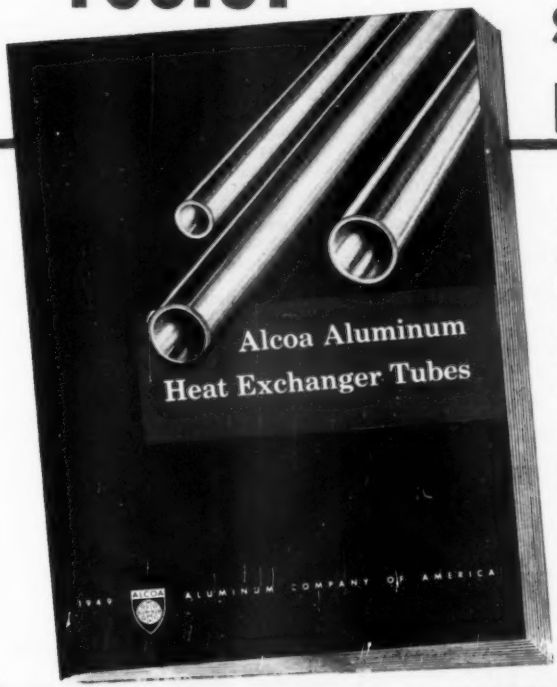

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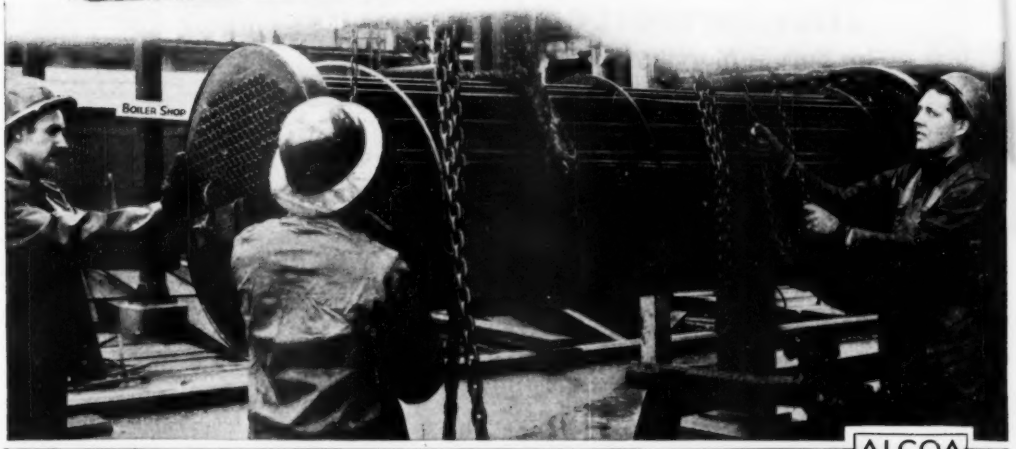

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is slowly introduced to the flask by means of this stopcock. Immediately after sampling is finished, heat (electric) is applied to strip light constituents from the lean oil or fat oil.

During distillation through the pellet-packed column, water and hydrogen sulfide will be removed; heavier hydrocarbons will condense in the still kettle of the low-temperature column, and lighter ones will be refluxed by the cold reflux condenser. Heating of the auxiliary still should be slow enough for good fractionation, but should be continuously increased, to insure a slightly higher pressure in the auxiliary still than in the low-temperature fractional distillation column at all times; reversal of this pressure differential will cause some of the cold condensate to flow back into the auxiliary column, with rapid vaporization and a violent pressure surge.

If the pressure in the low-temperature fractional distillation column reaches atmospheric pressure during the period of lean-oil or fat-oil stripping, methane is distilled off at a rate sufficient to maintain atmospheric pressure. The lean oil or fat oil may be safely assumed to be free of pentane and lighter gases when the temperature indicated by the thermometer at the top of the auxiliary column reaches 115° C. At this point heat is reduced and the connection closed between the two columns.

Condensate in the column is fractionated in the usual manner to separate methane, ethane, propane, isobutane, n-butane, isopentane, and n-pentane, after which the residue of hexanes and heavier is distilled back into the stripped lean oil or fat oil by cooling the auxiliary still with dry ice, and opening the connection between the stills. If any residue still remains after distillation, remove mechanically and add to the residue in the auxiliary still. The weight of each light hydrocarbon may be calculated from the amount distilled, and the weight percentage of each obtained on the basis of the water and hydrogen sulfide-free lean oil or fat oil, by weighing the lean-oil or fat-oil residue. For further information the volume, molecular weight, and A.P.I. gravity of the residue can be determined. Efficiency of the oil reclaimer may be checked since we now have an ideal sample, pentane and lighter free for A.S.T.M. distillation.

Economics of Oil-Well Corrosion Control

(Continued from page 61)

sion, it is wise to avoid different metals in the same well unless previous experience or laboratory tests indicate that no trouble is to be expected. If the use of such combinations is necessary from design or practical considerations, it is best to make sure that the area of the more anodic metal is large compared to the more cathodic. A galvanic series of metals in common use may be found in the "Corrosion Handbook" by H. H. Uhlig, p. 420. This table was compiled by F. L. LaQue[3] of International Nickel Co., for the behavior of the different materials exposed in sea water. However, it has been found helpful in predicting dangerous metal combinations in oil wells due to the similarity of ocean and well brines.

Galvanic-corrosion dificulties may also be experienced due to dissimilarities in physical character of the same material as for instance in the case of "ringworm" corrosion of tubing and rods previously explained. The use of fully normalized tubing and rods, free from foreign inclusions, will lessen this danger where known corrosive conditions exist. It has also been found helpful to remove mill scale in tubing, or on sucker rods where pitting is observed near breaks in the mill scale formation.

It is not always practical or possible to follow the rules of good practice just mentioned and corrosion

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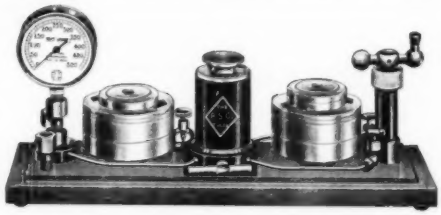

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will often take its toll despite their faithful observance. For this reason, considerable effort has been put forth to devise ways of overcoming most or all types of corrosion in a well. So far, no cure-all method has been perfected, but some very encouraging results have been obtained.

The search for suitable methods has, in general, followed three basic approaches:

1. Development of corrosion-resistant materials.
2. Changing the corrosive environment.
3. Preventing contact between corrosive media and well metal.

In the following discussion of the various methods of corrosion mitigation, we will attempt to set forth how they fit into the above three categories.

Corrosion - resistant metals.—Great strides have been made toward production of improved steels and corrosion-resistant alloys. Austenitic stainless steel and Monel pump parts and high-alloy steel rods and tubing are typical examples of such applications. These new alloys are giving much better performance than older metals, but unfortunately do not constitute a complete answer primarily due to their high cost and unpredictable availability. Furthermore, the process of improving materials is a long and indefinite one, because it is largely dependent upon steel manufacturer's initiative. Therefore, other means of combating oil-well corrosion that can be applied to steel products now in common use are of more immediate concern. Many new alloys are now undergoing field trial and it is hoped that some will be found with high enough life-cost ratios to make wide application attractive.

Emulsification of oil and water phases.—Some interesting work has been done on the relation between the internal resistivity and corrosiveness of well fluids. This work is based on the fact that electrochemical corrosion may be retarded by increasing the internal resistance of the electrolyte. The resistivity of well fluids has been found to be high when the water phase is largely emulsified in the oil phase. The phenomenon is the subject of several patents and where emulsions do not occur naturally the desired emulsification may sometimes be accomplished mechanically or chemically, or by a combination of the two, depending upon well conditions. The exact effectiveness and limits of applicability of this method have as yet not been established, but some encouraging results are being obtained.

Chemical inhibitors.—Possibly the most effective method of corrosion control is with chemical inhibitors. These chemicals have a distinct advantage over other methods in that all parts of the well fluid system are protected. The inhibitors are injected either at intervals, or continuously, down the annulus of the wells, usually in a water solution. Their main disadvantage is the high cost for treating such a "once through" system as chemical must be continuously added to maintain protection. The inhibitors in common use today are of three types: neutralizers, film formers, and polar or surface-wetting compounds.

The neutralizers such as sodium bicarbonate, soda ash, etc., fall into the classification of environment adjusters as they inhibit corrosion by decreasing the acidity of the well water. It often takes large amounts of these chemicals to alter the well water pH enough to stop corrosive attack. This treatment is, therefore, confined to wells where the amount of produced water is low such as high pressure condensate wells. Some tendency to form insoluble salts with subsequent plugging has been noted.

The film-forming group of inhibitors, which prevent contact between the corrosive media and well metal comprise a wide variety of materials of which sodium chromate and dichromate are the most important. The chromate inhibitors have been found to afford protection in concentrations as low as 50 p.p.m. This is somewhat below the previously recognized minimum effective concentration and makes the treatment of oil wells such as those in the Los Angeles Basin area economically feasible. Well A, (see Fig.8) is being treated with sodium dichromate. Some plugging has been noted in condensate wells where chromate or dichromate is used, but the salts so formed have usually been water soluble and may be washed out without removing the tubing from the well. Sodium dichromate has also given difficulty with emulsion formation on certain wells and thus far no method has been found of overcoming this emulsifying tendency.

Most of the organic inhibitors, which include the polar type, are proprietary compounds and thus their actual composition is unknown. Some of these inhibitors are showing good results and the number of wells being treated with them is increasing rapidly. Well B (see Fig. 9) is being treated with such an organic polar compound. No objectionable plugging or tendency to emulsify production have been noted with the use of these materials. The main disadvantage of the organic inhibitors is their high cost, but it is hoped that continued research will bring these costs down.

Mechanical coatings.—A great deal of work has also been done on the development of mechanical coatings such as metallic plating, plastics, or plastic paint which keep the corrosive media from contacting with the metal it is desired to protect. These coatings have met with a measure of success where abrasion is not too severe. Typical applications are tubing for nonpumping wells, gathering lines, fittings, and handling facilities. Again it must be remembered that breaks or abrasions in such a coating that expose the base metal may concentrate corrosive attack at those points under certain conditions. Therefore, it is essential that mechanical coatings be applied with no discontinuities and that they be maintained that way.

Maintaining a corrosion-control program.—Next in importance to determining an effective and economical method of combating oil-well corrosion, is maintaining a control program. Such a program should include means of regularly checking the effectiveness of corrosion prevention measures. This is particularly true where chemical inhibitors are being used, as changing environmental conditions may require altering the dosage to maintain optimum protection. It is obviously desirable to increase the dosage when necessary in order to prevent damage to well material and similarly an overdose is bad from the economic standpoint.

There seems to be only one sure proof that corrosion is being controlled and that is consideration of the breakdown history of the well. This criterion must be used in any final analysis of the effectiveness of a corrosion prevention method. However, it is often desirable to know, on a day-to-day basis, what relative amount of corrosion is taking place in a particular well. Several ways of getting such an indication have been worked out, and while none seems to be infallible alone, if several are used, a good indication of actual conditions is obtained.

The produced water from wells experiencing corrosion difficulty has been found to contain dissolved iron in varying amounts. Further, there is good evidence that ground waters encountered in oil bearing formations usually contain negligible amounts of iron and thus whatever is present may be assumed to be the result of corrosion. This observation is based on the results of many trials in different fields where successful control of corrosion usually results in iron concentrations in the neighborhood of 5 p.p.m A continuous record of the iron content of the effluent water has been found to be a good means of checking the effectiveness of control. Fig. 10 shows a plot of the iron concentration in the effluent water from well B before and during treatment with an organic corrosion inhibitor.

Sampling was started several weeks before actual injection began and the iron content was found to average 23 p.p.m The original injection rate of 1 gal. per day reduced this value to about 4 p.p.m. in a month. The injection was next stopped, resulting in iron counts similar to those of the pretest period. Injection was subsequently resumed and has been successively reduced from the origi-

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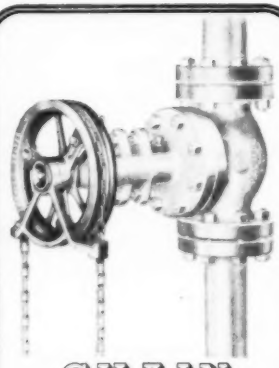

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nal rate of 1 gal. per day to 2½ qt. er day and iron counts have remained at a satisfactory level. The values of all samples taken are shown on the chart and an approximate curve has been drawn in to show the trend. This chart serves to illustrate the use of iron concentrations for a control check and it is felt to be the most useful tool for maintaining a good corrosion control program.

Another means of checking corrosion rates that has been used successfully as a control is the exposure of metal coupons in the well. These coupons are small pieces of typical oil well metals, usually 10 or 12 gage and measuring about 1 by 4 in. Ordinarily, several coupons are exposed in each test and are held in an insulated chuck in a position where well fluid will pass over them. The corrosion rate is estimated by the weight loss which will usually be sufficient over a 2-weeks period to give an accurate determination.

Coupon tests are also good for predicting the behavior of dissimilar metals in a well. For this purpose, four coupons are used, two each of the two metals. One dissimilar pair is coupled with a wire and the other is left uncoupled. The weight loss of the uncoupled pair will indicate the normal corrosion rate for the two metals and the weight lost by the coupled pair will show the combined effects of normal and galvanic corrosion. As these tests take considerable time, they do not lend themselves too well for use as a periodic check. However, they do yield interesting information and may be found particularly helpful where iron counts are difficult or impossible to obtain.

Iron counts combined with production rates and coupon tests will give a fair qualitative indication of corrosiveness, but, of course, tell nothing of the actual condition of down-the-hole well material. Therefore, means of inspecting tubing and rods are necessary to reduce breakdowns due to corroded material. In the case of tubing, caliper surveys, interior inspection systems, or pressure tests are good ways of eliminating damaged joints before they actually cause expensive failures. Sucker rods and boxes have thus far mainly been inspected by eye, but processes are now available for testing this material by magnetic particle or magnetic flux inspection. If these processes prove practicable, they will prevent the use of bad rods that could be overlooked by visual inspection.

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2. S. P. Ewing and J. F. Bayhi, "Cathodic Protection of Casing in Loudon Pool," Corrosion, p. 264, June 1948.

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Economics of Thermal Reforming

(Continued from page 69)

yields more than offset the increased operating and investment costs depends to a large extent upon the refiner's individual situation.

Thermal Reforming Correlations

As has been mentioned previously, the optimum reforming level, even at a constant set of price conditions and octane level, will vary for individual refiners depending upon the type of crude being processed and the type of equipment being employed. To permit a refiner to determine the optimum reforming level for his own particular case, the reforming correlations that were used to calculate the optimum reforming level of the hypothetical refinery have been included in this article.

Correlations made during the war by the correlation group of the primary processes and synthesis subcommittees of the technical advisory committee, a subcommittee of the technical committee to the Petroleum Industry War Council, and presented in Report No. TML-3 issued by the Technical Advisory Committee, have been checked with both plant and pilot-plant data, and were found to be in close agreement.

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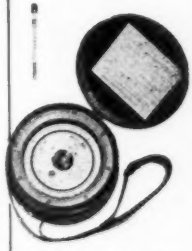

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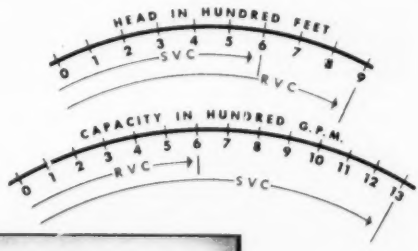

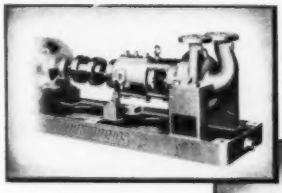

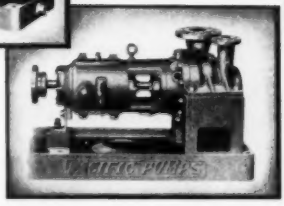

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sure of the gasoline production for a given reforming severity, it is necessary to know both Reid vapor pressure and molecular weight of the reformate. The increase in Reid vapor pressure of the butane-free reformate for various pressures plotted against the gas yield is shown in Fig. 3, whereas the molecular weight reduction obtained in thermal reforming is given in Fig. 4.

Fig. 5 shows a correlation for determining the octane number improvement (motor method) of the reformate obtained in thermal reforming. In this figure, the weight per cent gas is plotted at various pressures against the function $\frac{100(R-C)}{82.5-C}$, where R is the motor octane number of the butane free reformate, and C is the motor octane number of the heavy naphtha charged to the thermal reforming unit. Having the weight per cent gas yield, the octane number of the charge, and the average reforming pressure, the octane number of the butane-free reformate may be calculated by the use of Fig. 5.

Fig. 6 shows a correlation of the research octane number of reformate with its motor octane number for various gas yields. This correlation applied equally as well to reformate on a 100 per cent butane-recovery basis as on a depentanized basis, the average deviation being ±1.2 octane numbers.

A correlation of the lead susceptibility of reformate with dry gas yield for various lead susceptibilities of the heavy naphtha being reformed is shown in Fig. 7. The lead susceptibility is expressed as the slope on an Hebl ethylizing chart. This chart is widely used by refiners for plotting TEL content of gasoline against octane number, because the resultant plot usually is a straight line. The correlation shown in Fig. 7 applied equally well to octane numbers by both motor and research methods, and the average deviation is ±0.1.

A study of the economics of thermal reforming for a hypothetical refinery processing 20,000 bbl. per day of East Texas crude indicates:

1. With a price structure approximating present-day conditions, maximum profits are obtained when charging 3,000 bbl. per day of heavy naphtha, equivalent to 275°-400° F. boiling range, and operating at a reforming severity equivalent to an octane-number increase of reformate of about 14.0. However, even at optimum reforming conditions, the savings are comparatively small, being in the order of magnitude of 1 cent per barrel of total gasoline.

2. Octane-number specification has a relatively large effect on the economics of thermal reforming. At the higher octane levels, it is necessary to reform thermally in order not to exceed the maximum allowable TEL content of 3 cc. per gallon.

3. Decrease in gasoline price increases the attractiveness of thermal reforming. At a low gasoline price it is possible to operate over a relatively wide range of reforming severities and still be near the optimum. Whereas with a high gasoline price, a small variation in reforming severity results in a large change in profits.

4. Thermal reforming is considerably more attractive when the price of butane is high than when it is low. Inasmuch as the price of butane is usually higher in winter than in summer, and since thermal reforming also is employed for increasing gasoline volatility, it is apparent that thermal reforming is more economically advantageous during the winter months than in summer.

5. Economics of thermal reforming and the optimum reforming level will vary for individual refiners depending upon the type of crude being processed and the type of equipment being employed. Consequently, the thermal reforming correlations used in determining the optimum level for the hypothetical refinery have been included in order to permit a refinery to determine the economics of thermal reforming for his own situation.

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(Continued from page 73)

year of operation were attributable to stuck valves. Four of the periods occurred after the crankcases were cleaned and filled with a heavy-duty detergent oil. It was found that detergents are not highly recommended for use in L-head engines that have been using other types of oil for any great length of time. With the aid of several brands of solvents in varying quantities, the plant kept going. In January 1948 the engines were cleand and refilled with a naphthenic oil of very high quality. At this time the jacket-water temperatures were readjusted to 165°-170° on the inlet and 185° on the outlet. Until April 15, 1948, there were two more cases of valve trouble. Note that on April 15, the graph shows that fuller's earth-type oil filters were installed. No change of oil is indicated thereafter, but a marked change may be found in the operating time and in the oil consumption. One case of valve trouble appeared before February 26, 1949, when overhauling was begun on the plant units.

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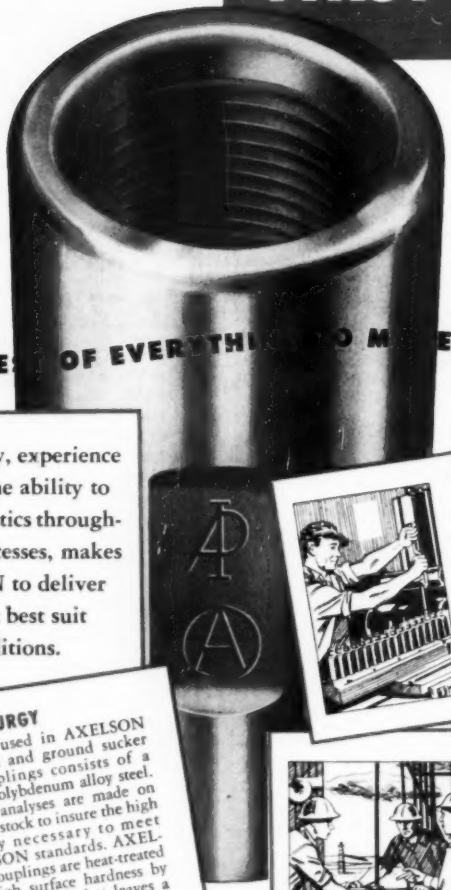

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AXELSON FIRST CHOICE
in sucker rods, deep well plunger pumps, pumping components and hydraulic long stroke pumping units.

SUCKER ROD

AXELSON *Couplings*

THERE IS NO ECONOMICAL SUBSTITUTE FOR QUALITY

AXELSON MANUFACTURING CO. • PLANTS—Los Angeles 11, St. Louis 16 • OFFICES—New York City 7; Tulsa 1; Buenos Aires, Argentina; Caracas, Venezuela • DISTRIBUTORS—Jones & Laughlin Supply Co.; Great Northern Tool & Supply Co.; Industrial Agencies, Ltd., San Fernando, Trinidad, B.W.I.; Industrias Waldrip & Campbell, Barcelona and Maracaibo, Venezuela.

broken vanes within the 3-month period following the application of load. There was considerable influx of powdery abrasives, pulled in with the stepped-up velocity, which ground the phenolic strips out in a hurry. Oil is applied at the rate of 3 pt. per day, and blade wear has been almost completely eliminated — no replacements in over 1½ years. The recent inspection of the engines has disclosed that the largest cylinder diameter is 6.003 in. and the average is 6.002 in. Crankshafts show little, if any, wear although several bearings were replaced that showed indications of a poor bond existing between babbitt and shell. The neutralization number of crankcase oil is being held below 0.3 very easily by changing the filter elements at intervals of 2,000 hours. No crankcase draining is necessary, as sludging no longer occurs. It is not anticipated that the operating cost of the plant will rise in the future to an alarming level because most of the personnel has acquired a knowledge of machine characteristics that will aid in maintaining economical compression costs.

Operating Costs

Finally, something should be said about costs. The direct operating cost as set forth herein includes labor, lubricants, replacement parts, power bill, and a proration of car expense in addition to tools that are necessary to repair the equipment. No depreciation is added here.

	First year	Second year
Engine operating time in hours (3 units)	25,540	25,099
Gas compressed (M.c.f.) (3 units)	1,421,398	1,216,610
Direct operating cost of plant (3 units)	$2,606.54	$3,460.30
Compression cost (M.c.f.)	$ 00.00184	$ 00.00284

As a matter of added information and interest, the total operating cost for the calendar year of 1948 was $0.00556 per M.c.f. This figure includes taxes, depreciation, and the direct operating cost from the above table.

The routine labor and inspection consumes about 20 minutes a day of the time of some member of the maintenance group. This schedule has proved entirely adequate for all practical purposes. The units are protected from low oil pressure and high temperature in cooling systems by simple switches that ground the magnetos at preset values.

On the whole, the plant has proved entirely satisfactory because of efficient operation at low cost, and due to installation of this plant the useful life of the gas wells served by it has been extended considerably.

Gas Handling in Agua Dulce Field

(Continued from page 79)

the solution G.O.R. of 437 cu. ft. per bbl. $\times \frac{640}{40}$ or 321,632 cu. ft. per day.

It has been determined that 6 bbl. of oil per day will realize the same revenue as the 321,632 cu. ft. of gas. Therefore, in order to maintain maximum reservoir energy without suffering revenue loss, "equivalent" or "script" oil is produced from the oil column instead of producing the gas.

Even from this brief outline, it may be noted that there are many problems encountered in such a project which require the full cooperation of all operators. One of the most feared problems is having a plant breakdown or similar hazard which would prevent an operator from returning gas to the sand. In order to meet such an emergency, The Chicago Corp., as have some of the other operators, has built up a gas "bank." That is, it has injected into the reservoir an excess amount of gas, which, in case of emergency, will be drawn upon to meet any shortages. As of May 1, 1949, the company had a surplus gas injection of 62,874 M.c.f. in the South Bertram sand, and 65,147 M.c.f. in the lower Wardner sand. The average daily gas injection for these two sands is 4,435 M.c.f. in the South Bertram and 4,465 M.c.f. in the lower Wardner. Thus, it may be seen that the present gas bank would take care of approximately 14 days of production.

In order to visualize what is occurring in these sands, refer to the pressure-performance curve for the lower Wardner sand. From the time the Bertram and Wardner sands were first tapped until December 1944 the gas-cap gas was produced and sold. In December 1944 and subsequently, this gas-cap gas was processed, and after subtracting shrinkage and fuel losses of 7.58 per cent, was then returned to the reservoir. As may be noted on the pressure-performance curve, the reservoir pressure flattened at this point but continued to decline, though not as rapidly as previously. It was at this time that the operators in these sands decided not only to cycle the gas-cap gas but also to return the casing-head gas. The program which has already been discussed was put into effect and the results, pressure-wise, are indicated on the pressure-performance curve. It may be noted from this curve that for the past 12 months, the reservoir pressure is not only holding its own but is showing a slight gain.

It may be pointed out that not only is this program conserving quantities of casing-head gas, but the reinjection of this casing-head gas into the reservoir will, according to the latest estimates, increase the ultimate oil recovery by 50 per cent.

Cost of installing this type of vapor recovery system is quite high; and the payout, when compared to that of processing high-pressure rich gas, will be a very long term. The conservation of gas and the payout in the distant future, in say 20 years, must be the deciding factors. For example, the cost of our vapor-recovery system as installed 4 years ago is as follows:

Field lines	$ 75,000
Plant equipment	145,000
Total	$220,000

This represents the actual cash which the company spent for this equipment. However, as one injection engine was converted to this casing-head service, $80,000 additional must be added to this, making a total of $300,000, which is required to handle 7,500 M.c.f. of casing-head gas from 100 psi. to the absorber pressure of 1,200 psi. for processing; thence to the pipe-line companies for sale. At the time this equipment was installed the cost of drilling a well into rich prime gas reservoirs would have been about $60,000. Thus two wells could have been drilled, dually completed, for a cost of about $120,000, which would have produced the same 7,500 M.c.f. of gas as is being handled by the vapor recovery system at a cost of $300,000. It is to be noted also that since this casing-head gas is being reinjected into the reservoir, another one of the existing injection engines is being used to handle this gas, which when added at an estimated cost of $80,000 will make the total cost chargeable to this project $380,000.

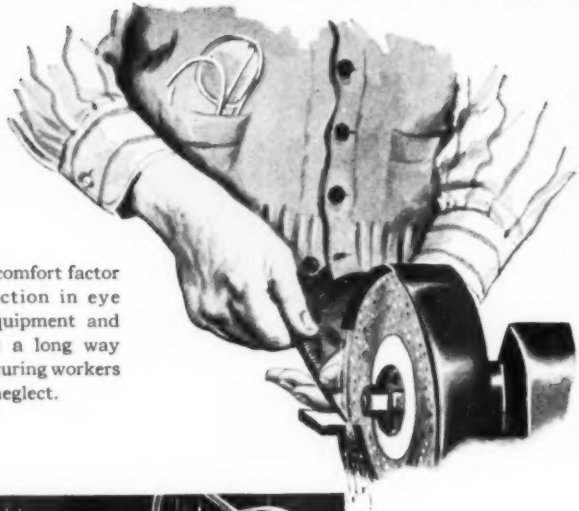
Besides this, the amount of liquids recoverable from the casing-head gas test about 0.25 g.p.m.; whereas, the prime gas tests about 0.80 g.p.m. It can thus be seen that it is more profitable on the short-term payout to process the rich gas rather than recover the casing head. But as a project to conserve our natural resources and also to increase the ultimate recovery from the reservoir, it is believed that the cost has been justified.

BOOKS

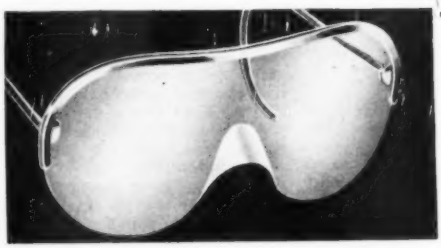
MAP OF TEXAS AND EASTERN NEW MEXICO. Published by Southwest Mapping Co., 1101 Fort Worth National Building, Fort Worth. $2.50.

This map, 30 by 32 in., is prepared on a scale of 1 in. = 30 miles. It shows oil and gas fields, and official Railroad Commission field names indexed by districts. Position and size of fields are plotted from county maps. The map also shows general locations of principal geologic provinces.

WILLSON . . . has the remedy!



Add the comfort factor to protection in eye safety equipment and you'll go a long way towards curing workers of such neglect.



FeatherSpec Style FW2

Here is comfort in nine-tenths of an ounce. WILLSON FeatherSpecs* with a large, overall plastic lens rest lightly on the nose and can be worn all day—even over prescription spectacles—without fatigue. Workers say they hardly know they are wearing any eye protection. Yet they prove adequate protection on many jobs such as light grinding, woodworking, spot welding and inspection of work in process.

If you want your investment in safety equipment to pay off—don't neglect comfort in your specifications.

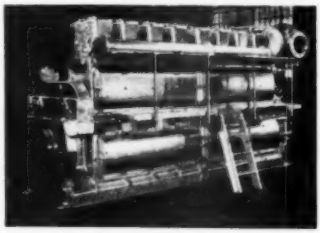
DAILY REMINDERS

Daily reminders such as WILLSON "Blind Man" safety posters keep workers in hundreds of plants aware of the need for personal safety measures. Supplies are available on request.

WILLSON
"Established 1870"

WILLSON PRODUCTS, INC. • 246 WASHINGTON ST. • READING, PA.

The ALCO PLAN for DIESEL ECONOMY



Flexibility and Low Cost Offered by ALCO Standardized Engine

THE ALCO plan helps Diesel plants where flexibility, economy, dependability, and provision for future growth are important. In one size of stationary Diesel engine, ALCO offers unusual advantages where multiples of 540 to 1,300 horsepower can be used.

LOW COST...This basic design, also used in ALCO switch engines, is quantity-produced to make both first cost and the cost of replacement parts unusually low.

FLEXIBILITY...You can fit fluctuating load curves more closely than with fewer engines of larger size, or of varied capacity.

LESS WEAR...This more efficient use of engines means less wear per installed horsepower. The unused capacity of operating engines at any time need not exceed the capacity of one engine. There is no wear on the idle engines. Larger engines would necessitate greater wear per installed horsepower, with resulting higher costs.

GREATER EFFICIENCY...With engines operating near rated load, fuel consumption is less and operating conditions are better.

UNIFORM ENGINE WEAR...With several units of the same size, engines can be operated in rotation, allowing planned inspection and maintenance with minimum "down time."

STAND-BY ECONOMY...When all units are the same size, stand-by capacity can be limited to one size of engine the same as all others. With a variety of engine sizes, stand-by capacity might easily have to equal the largest single unit.

SIMPLIFIED MAINTENANCE...Uniform engine size means uniformity of replacement parts and of maintenance procedures; smaller stocks of parts; minimum of special tools; shorter "down time."

EASY GROWTH...As demand increases, gradual growth can take place by adding extra units of the same size.

• • •

What your actual savings can be with this compact, efficient engine should be computed carefully. Call in an ALCO engineer to discuss the ALCO plan in relation to your needs.

AMERICAN LOCOMOTIVE COMPANY

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STANDARDIZED
DIESEL ENGINES

Cost-imating

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

Construction Costs 1948-49

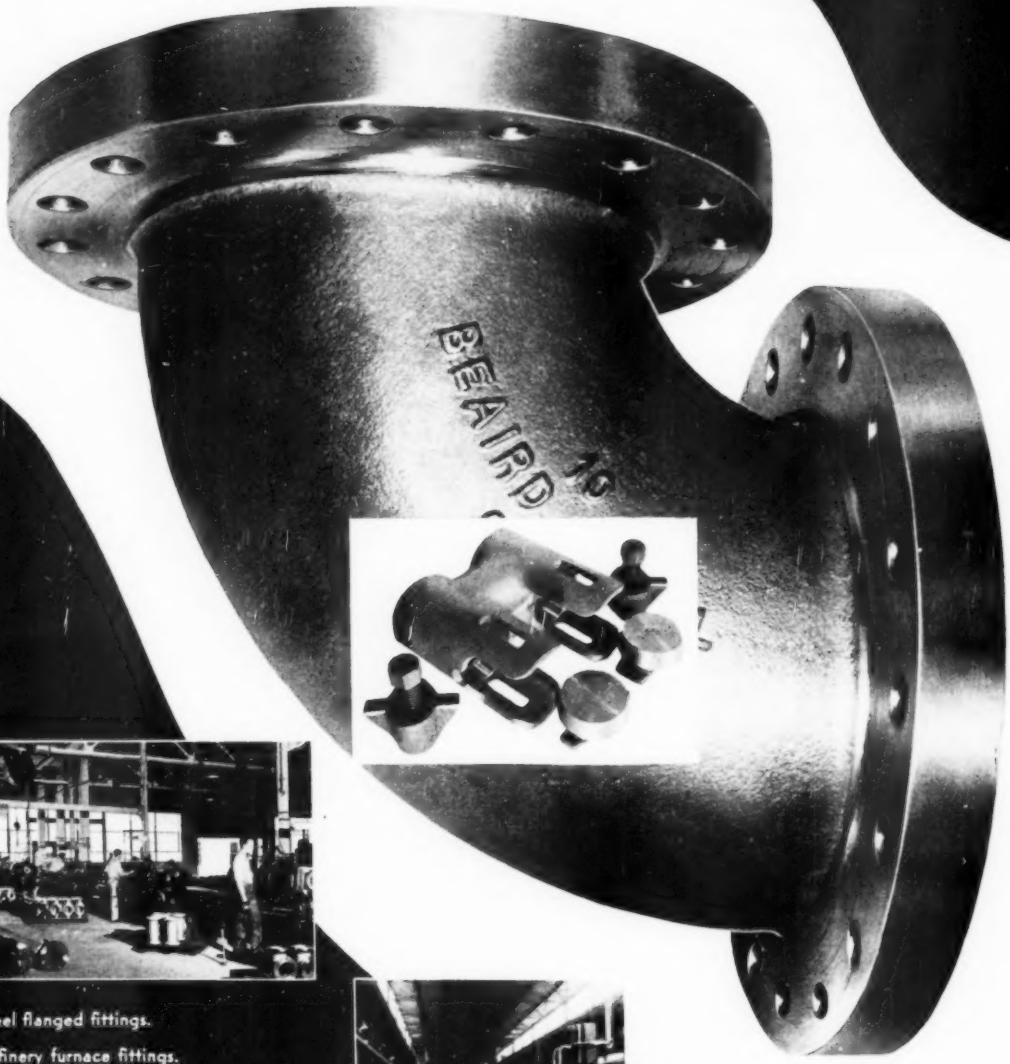
APPROXIMATE PRICE INDEXES (1946 = 100) FOR 1947, 1948, AND 1949

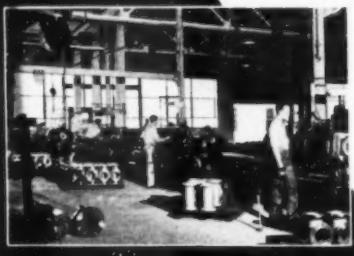
Industry or process—material:	1947	1948	Month	1949	Reference	Complete index appears in Cost-imating
Engineering News Record, construction	122	132	June	136	E.N.R., McGraw-Hill, New York	No. 1, Oct. 21, 1948
Marshall-Stevens:						
Process industries	121	132	Jan.	134	Chem. Eng., February 1949	No. 1, Oct. 21, 1948
Electrical supplies	122	135	Jan.	138	Chem. Eng., February 1949	No. 1, Oct. 21, 1948
Steam power	122	132	Jan.	135	Chem. Eng., February 1949	No. 1, Oct. 21, 1948
Chemical	119	130	Jan.	132	Chem. Eng., February 1949	No. 38, July 7, 1949
Refrigeration	129	141	Jan.	141	Chem. Eng., February 1949	No. 22, Mar. 17, 1949
Building (E.N.R.)	130	132	Feb.	135	Eng. News Record	No. 1, Oct. 21, 1948
Petroleum industry:						
Marshall-Stevens	121	132	Jan.	135	Chem. Eng., February 1949	No. 1, Oct. 21, 1948
Author	130	142	Apr.	148	See footnote ††	No. 1, Oct. 21, 1948
Materials or equipment:						
Exchangers	*115	*130	Year	*128		No. 2, Oct. 28, 1948
Steel, composite iron and steel	117	141	Apr.	151	Wholesale prices, B. of Labor statistics	No. 5, Nov. 18, 1948
Structural	117	*145	Apr.	151	Code 452, wholesale prices	No. 18, Feb. 17, 1949
Plate (tank)	117	*160	Apr.	145	Codes 446.2 and 448.1, wholesale prices	No. 5, Nov. 18, 1948
Pipe, black ¾-in.	*119	*145	Apr.	152	Code 435, wholesale prices	
Lumber, composite	*155	175	Apr.	163	Wholesale prices, B. of Labor statistics	No. 7, Dec. 2, 1948
Pine, yellow, timbers	*152	161	Apr.	154	Code 522-9.1, wholesale prices	No. 7, Dec. 2, 1948
Pine, ponderoso No. 3		176	Apr.	169	Code 524-1, wholesale prices	
Redwood, heart		159	Apr.	167	Code 528-3, wholesale prices	
Cypress, C grade		178	Apr.	184	Code 529-2, wholesale prices	
Building materials, composite	*130	153	Apr.	148	Wholesale prices, B. of Labor statistics	
Brick and tile	*114	137	Apr.	131	Wholesale prices, B. of Labor statistics	No. 22, Mar. 17, 1949
Sand	*112	122	Apr.	128	Code 579, wholesale prices	*
Cement	*111	125	Apr.	129	Code 509, wholesale prices	No. 22, Mar. 17, 1949
Paint and paint materials	*136	135	Apr.	133	Wholesale prices, B. of Labor statistics	No. 22, Mar. 17, 1949
Castings, cast iron	*160	*170	Apr.	171	Codes 416.4 and 434.1, wholesale prices	No. 26, Apr. 14, 1949
Pumps	*117	*133	Year	*128		No. 29, May 5, 1949
Compressors	114	*128	Year	*126		No. 36, June 23, 1949
Engines	111	*122	Year	*120		No. 36, June 23, 1949
Insulation, asbestos pipe covering	*115	122	Apr.	130	Code 767, wholesale prices	
Pipe, sewer	*110	121.5	Apr.	119	Code 572.1, wholesale prices	
Machinery	*117	*124	Year	*125		Quest. on Tech., Feb. 17, 1949
Instruments	*113	*115	Year	*113		No. 34, June 9, 1949
Labor:						
Skilled construction	112	125	Mar.	132	E.N.R., March 17, 1949	
Common	119	134	Mar.	142	E.N.R., March 17, 1949	
Skilled or semiskilled manufacturing	112	122.5	Year	*127	E.N.R., March 17, 1949	
Refinery workers, weekly income	109	126	Jan.	†135	Survey of current business	No. 1, Oct. 21, 1948

*Estimated. †70 per cent iron and steel, 15 per cent each of electrical and of building materials. ‡January 1949 wage rate was $76.93 per week.

No. 40 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

BEAIRD CAST STEEL FITTINGS





Steel flanged fittings.

Refinery furnace fittings.

A bank of high speed turret lathes in the Beaird machining division.

The electric foundry which casts carbon and alloy steels.

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THE J. B. BEAIRD COMPANY, INC.
SHREVEPORT, LOUISIANA

FROM THE FAMILY OF "BEAIRD-BUILT" PRODUCTS SOLD 'ROUND THE WORLD

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For further information—without obligation—I have checked numbered circles above

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21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

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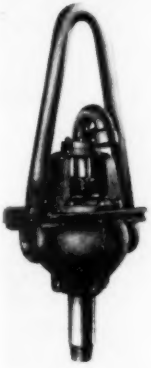
OIL AND GAS EQUIPMENT *Digest*

IT'S NEW CHECK IT

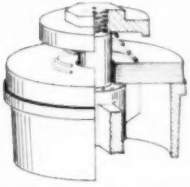
by Dan B. Miller

(1) MODEL E-6600 SWIVEL is rated at 350,000 lb. capacity at 100 r.p.m. Features a spherical swivel body of manganese vanadium steel providing maximum strength with minimum weight, oil-bath lubrication, long-radius gooseneck, Timken true apex main thrust bearings, and spring-loaded lubricated wash-pipe packing. There are no gland nuts to work loose and stem can be removed without disconnecting. Lower stem-lubricated packing is triple sealed and nonadjustable. The large trunnions for the bail are cast integral with the body. All packings are automatically adjusted and lubricated through Alemite fittings. *Wheland Co.*



IT'S NEW CHECK IT

(2) NEW INDUSTRIAL PUMP VALVES. Especially designed for reciprocating pumps in such uses as pipe-line and refinery service, these valves and seats are furnished in bronze alloy with a special phenolic valve plate for operating temperatures up to 300° F. and pressures up to 750 psi. For temperatures up to 950° F., this same design is available in stainless steel. In the three-web seat, the center guide post is cast as an integral part of the hard bronze alloy seat, thus eliminating a threaded connection which often corrodes and breaks. Life of the phenolic valve plate can be doubled by reversing it when one side becomes excessively worn. *American Iron & Machine Works Co.*



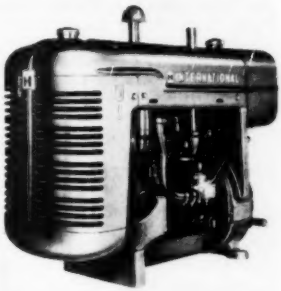
IT'S NEW CHECK IT

(3) ALFRAME ALUMINUM ALLOY BUILDINGS are designed to provide factory-made buildings of standard components, which can be transported easily to site and rapidly erected. Based on a standard bay 9 ft. long by 36 ft. clear span, the whole building is fabricated in transportable frames and panels from aluminum alloy

extrusions and sheeting, of high strength, yet light in weight. Any number of standard bays may be employed in a complete building. The Standard Alframe, measuring 72 by 36 ft. employs eight bays, and weighs only 4½ tons, it can be erected in 80 man-hours. *Structural & Mechanical Development Engineers, Ltd.*

IT'S NEW CHECK IT

(4) FOUR-CYLINDER GASOLINE ENGINE for a wide range of applications, is suitable for powering fans or blowers, oil or water pumps, generators, portable in-plant or outdoor units, and for many other similar installations. It is available as a stripped engine or with job-engineered attachments up to a complete power unit, and can be equipped to operate either on gasoline or natural gas. Stripped, the U-1 delivers a maximum of 16.3 b. hp. at 2,500 r.p.m. The engine itself weighs approximately 280 lb., the complete power unit, 450 lb. *International Harvester Co.*



IT'S NEW CHECK IT

(5) WALKER TRIPLE HYDROMETER CASE. The case is constructed of sparkproof cast aluminum to give durability and lighter weight. The hinges are part of the casting for greater hinge strength. The case is lined with felt to protect the bodies of the hydrometers. The delicate parts of the hydrometers, the stems, are protected by

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

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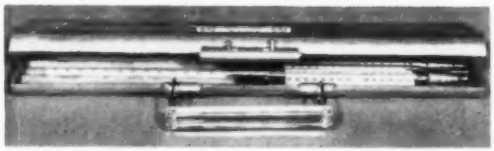


soft wool sheepskin liners. The latch parts are made of brass and the latch springs are made of 18-8 stainless steel to resist sour-crude corrosion. All the latch parts are easy to remove and replace. *W. L. Walker Co.*

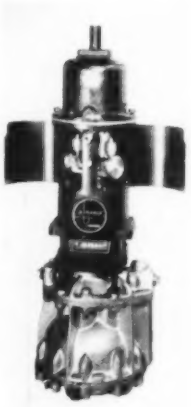
IT'S NEW CHECK IT

(6) OIL-FIELD CATTLE GUARDS for use at leases, plants, pumping stations, and other installations or areas

inclosed by fences. The cattle guard is of all-welded construction, is fabricated of 60-lb. railroad rail runners, 80-lb. railroad rail beams, and end posts of 2½-in. steel pipe. End posts are self-supporting in the upright position and can be folded down for transportation or storage. Suitable for either permanent or temporary installation. Delivered completely primed and painted. Standard sizes: 8 by 15 ft., 8 by 20 ft., and 10 by 20 ft. *Houshi Drilling Co.*

IT'S NEW CHECK IT

(7) ASKANIA TRANSOMETER will generate an air pressure signal from 2 to 15 lb. The transometer was developed originally as a means for translating liquid flows to low-pressure air signals for measurement and control purposes. Since it employs a positive displacement meter for measuring the liquid flows, viscosity effects on the measurements are small compared with the viscosity effects on measurements made by the usual methods. It can be used for other speed-control applications. The initial output pressure signal is adjustable over a range of 0 to 3 psi. and the top output pressure signal over a range 10 to 18 psi. *Askania Regulator Co.*

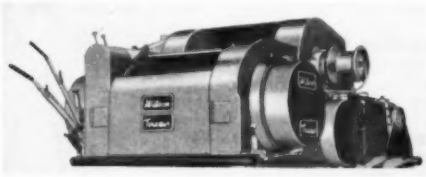


IT'S NEW CHECK IT

(8) STEEL PIPE LINED WITH SARAN RUBBER. Saran rubber 187, a Dow Chemical Co. product, is especially resistant to abrasion and excels as an inert lining material when in contact with petroleum products, chlorinated hydrocarbons, general acids, and most chemical mixtures. The standard saran rubber lining is ⅛ in. thick and, in general, its operating temperatures range from —5° to 167° F. dependent somewhat on service conditions. Available in all standard sizes from 8 to 36 in. inclusive. Standard fittings are also produced in the same size range. On special order, the company will fabricate pipes with thinner steel wall sections offering cost and weight economies, as well as pipes with thicker saran linings to accommodate unusually severe service conditions. *Michigan Pipe Co.*

IT'S NEW CHECK IT

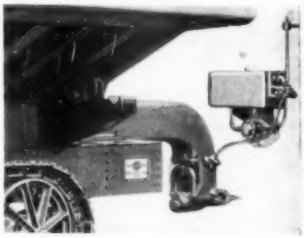
(9) SUPER TORCAIR DOUBLE-DRUM WINCH. Truck mounted for quick portability and immediate operation, the winch is used for servicing wells up to 6,000 ft. with



2½-in. tubing. The winch is air controlled throughout. An air throttle on the engine combined with the air control for air-tube disk clutches makes it possible to keep controls to a minimum. One valve controls both high and low-drum clutches and engine throttle to operate the main drum while another valve controls the drum clutch and the engine throttle to operate the sand drum. A friction-clutch-operated oil-bath rotary-drive jackshaft is provided. *Wilson Manufacturing Co., Inc.*

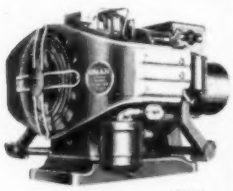
IT'S NEW CHECK IT

(10) HYDRAULIC PUMP UNITS for the operation of Forged-Trak dump trailers are now adaptable to all makes of track-type tractors. The hydraulic pump unit provides smooth, positive control of dumping operations. The pump, tank, and valve unit is built for heavy duty and long life, requiring a minimum of attention and maintenance. Controls for the hydraulic system are located near the tractor operator, ready for instant spotting of loads. *Athey Products Corp.*

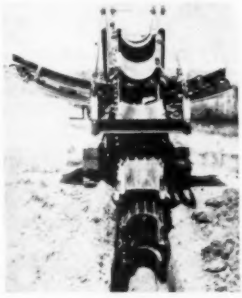


IT'S NEW CHECK IT

(11) 5,000-WATT A.C. DIESEL-ELECTRIC PLANT. The Model 5DRP combines unusually smooth operation and compact design, and produces low-cost electric power. Its prime mover, an opposed two-cylinder, air-cooled diesel engine, runs so smoothly that it requires no bolting down, no special base. Integral shock mountings make it possible to operate this unit right on the floor. Adaptable to portable applications, it is available in 60 to 50-cycle and in all standard voltages. It provides economical electric power for construction projects, oil barges, and many other applications where low-cost primary electric power is essential. *D. W. Onan & Sons, Inc.*



(12) STRIPPING BUCKETS for stripping pipe for takeup and repair are designed for installation on the digging wheel of Cleveland trenching machines. Buckets are available in two sizes, 16 and 22 in., stripping pipe from 4 to 16 in. in diameter. They permit excavating down to and along both sides of the pipe to at least its horizontal diameter, thus completely freeing the pipe for takeup with no bending damage due to earth bind. Contour of the stripping buckets greatly facilitates their following and staying on the line despite sidebends. Because the buckets are practically concentric with the pipe being exposed, all danger of tooth or rooter damage is virtually eliminated. *Cleveland Trencher Co.*



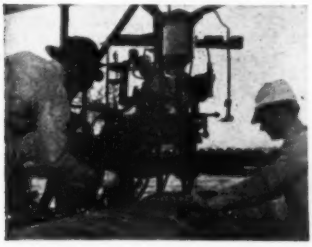
IT'S NEW CHECK IT

(13) RUSTNODE. A new magnesium anode that offers cathodic protection against rust scaling on condenser

heads, dividers, and tube sheets. Rustnode is designed to supplement water treating for most economical protective results, but in some cases may be used as the only practical means of corrosion prevention in condenser heads. The new anode, which is designed to protect only the walls of the chamber within which it is placed, may be used within both fixed and floating heads. A plastic-shielded mount allows all of the current flow to be directed to useful protection, with little loss due to overprotection of immediate surfaces. *Cathodic Protection Service.*

IT'S NEW CHECK IT

(14) DOUBLE-JOINTING PIPE BEFORE STRINGING. Designed to save time, money, and labor on pipe-line construction work. Consists of welding two joints of pipe together with specialized equipment under closely controlled conditions before being delivered for stringing. This process provides quicker, better welds at less cost on large-diameter pipe and materially speeds up the laying of the line. Complete package units including welding head, pipe-rolling rig, fit-up jigs, discharge conveyors and yard racks, and complete power units consisting of welding generators, air compressors, power generators, and all necessary auxiliary items can be furnished. *Reed Engineering Co.*

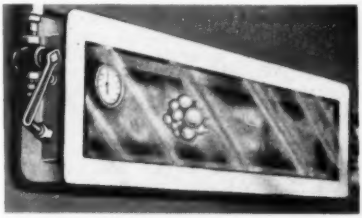


IT'S NEW CHECK IT

(15) HORIZONTAL TRIPLEX PLUNGER PUMP has a capacity of up to 44 bbl. per hour at 900 lb. working pressure. Primarily designed for small oil leases, with special application to crude-oil gathering systems, salt-water disposal, and fresh-water supply, the Plunger pump is adaptable to any service calling for a rugged, high-pressure unit having a capacity of from 22 to 44 bbl. per hour. It is equipped with a molybdenum-alloy cast-iron fluid end for oil service or with an aluminum-bronze fluid end for corrosive fluids. *Gaso Pump & Burner Manufacturing Co.*

IT'S NEW CHECK IT

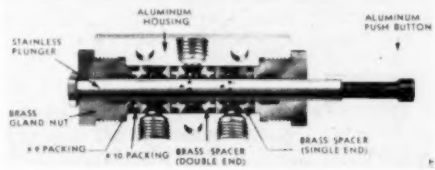
(16) VACUUM SEAM TESTER. This compact, portable unit effects substantial savings by eliminating the necessity of taking out of service old equipment to be



tested. In the construction of new tanks and storage vessels, the tester detects unsuspected pin-point leaks. Tester operates on a simple, efficient vacuum principle. Seams are covered with soap suds. Inspection box, with clear glass top and soft rubber base is laid over seam. A powerful vacuum created within the inspection box draws air through any leaks, causing soap bubbles to form. Testers are available in a wide variety of sizes and shapes for inside corners, outside corners, circumferential and straight seams. *American Pipe & Steel Corp.*

IT'S NEW CHECK IT

(17) O AND OE VALVES, an entire new line of small single-plunger control valves. These valves feature the utmost simplicity in design, sturdy construction, and ex-



treme ease of operation. Valves are balanced and will remain in position until changed. The flow is through the plunger and around the seals, thus prolonging the life of the packing and valve parts. Series O and OE valves are furnished tapped for either ⅛ or ¼-in. pipe connection, and are available in two-way; three-way open exhaust; three-way piped exhaust, double two-way; four-way, and five-way designs, and with either push-pull or push and spring return actions. *C. B. Hunt & Sons, Inc.*

IT'S NEW CHECK IT

(18) GAMI ROTARY PUMPS. These new pumps employ the use of a mechanical seal and a self-lubricating-type inboard sleeve bearing to carry overhung drives.

The seal and bearing assembly are interchangeable on the same shaft with the standard stuffing box of the GA type pump, so that if service conditions change, substitutions of seal or stuffing box can be easily made. The new line, ideally suited to installations requiring high vacuum and a dripproof construction, are designed for handling liquids comparatively free from abrasive or corrosive substances, and are capable of handling a considerable amount of air or gas in the liquid. The new pumps are regularly used for handling liquids of various viscosities from tar and heavy oils to light liquids such as gasoline and kerosine. *Worthington Pump & Machinery Corp.*

IT'S NEW ✓ CHECK IT

TRADE LITERATURE

(19) MODEL L DRAW WORKS. This new catalog describes a completely air-controlled unit, available as a simple hoist in either a single or double-drum version, as well as fully equipped with rotary drive, automatic cathead, for use as a draw works. *Cardwell Manufacturing Co., Inc.*

(20) SAFETY-CIRCLE PROTECTION is a new eight-page bulletin describing design and construction features of the "Safety-Circle" motor. Safety-Circle dripproof and splashproof motors are available in sizes from 1 hp. at 1,800 r.p.m. to 20 hp. at 3,600 r.p.m. *Allis-Chalmers Manufacturing Co.*

(21) SUCCESSFUL SEISMIC SURVEYS. A well-prepared, fully illustrated, 16-page brochure illustrates the three main factors to successful seismic surveys: experienced and highly trained personnel; up-to-date, proven, and carefully designed seismic instruments; and latest designed drilling and automotive equipment. *Southern Geophysical Co.*

(22) ALVEY CONVEYORS is a loose-leaf bound, 184-page, illustrated catalog with design and data sheets for installations in a great variety of industries and special circumstances. Complete specifications on each conveyor offered by the company are included. *Alvey Conveyor Manufacturing Co.*

(23) SOUND POWERED INTERCOMMUNICATION SYSTEMS describes a method of communication designed to meet the demand for safe, dependable operation, with a minimum of maintenance. *Wheeler Insulated Wire Co., Inc.*

(24) CHAIN PIPE WRENCHES is a folder illustrating and describing a line of chain wrenches capable of handling pipe up to 18 in. Other pipe tools made by the company are also listed. *Billings & Spencer Co.*

(25) SILVACEL. This brochure describes the action and advantages of Silvacel, a douglas fir fiber material for controlling lost circulation. Also describes the method of using Silvacel. *Weyerhaeuser Timber Co.*

(26) OIL EMPLOYMENT DIRECTORY describes a booklet that furnishes names and addresses of choice companies in the oil industry, showing just where to apply for employment. *Oil Industry Mailing List Co.*

(27) SERVICE MANUAL is a 24-page instruction manual covering the operation, maintenance, and servicing of Emsco J-750, J-1,000, J-1250, and JB-1250 drilling rigs manufactured during 1947, 1948, and 1949. *Emsco Derrick & Equipment Co.*

(28) DRILLING AND SERVICE is a file folder containing instructions for assembling and maintaining core barrels, diamond coring instructions, diamond-bit types, diamond bit-costs, core-barrel and parts price list, core-barrel rental and service, core-barrel accessories parts list, aluminum core boxes, and eight core-barrel cross-sectional prints. *Drilling & Service, Inc.*

(29) MODEL JO HYPRESSURE JENNY describes an instantaneous steam cleaner recommended for cleaning all kinds of production machinery and other field equipment. *Homestead Valve Manufacturing Co.*

(30) BULLETIN 249 is an eight-page, multicolor brochure which illustrates and completely describes spiral, coil, bulk, flat, cut, and molded ring gaskets and packings. *Universal Packing & Gasket Co.*

(31) WELL SURVEYING INSTRUMENTS AND SERVICES is an eight-page illustrated brochure explaining in detail the services offered and equipment used. *Sperry-Sun Well Surveying Co.*

(32) MOST H.P. HOURS describes the many applications and the manufacturing procedures of air-cooled, single, two, and four-cylinder engines, ranging from 2 to 26.8 hp. *Wisconsin Motor Corp.*

(33) TRUCO DIAMOND DRILL BITS gives complete specifications and operating data on this line of coring bits, including a section on care, use, and coring procedure. *Wheel Trueing Tool Co.*

(34) LUBRICATION OF "OILWELL" MACHINERY, a complete 24-page manual, explains the care and operation of oil-well equipment manufactured by the company, in both Spanish and English. This maintenance manual also lists foreign offices and representatives of the company. *Oil Well Supply Co.*

(35) EXPANSION JOINT DESIGN GUIDE. This 28-page bulletin, containing numerous illustrations, charts and tables, was prepared for the purpose of simplifying the selection and application of expansion joints in piping systems. Data contained aid in the proper selection of the size and type expansion joint necessary for varying requirements of temperature, pressure, and other factors surrounding each individual application. *Chicago Metal Hose Corp.*

(36) SHALLOW OR DEEP DRILLING WITH CATERPILLAR OIL-FIELD ENGINES. The eight-page, two-color booklet contains pictures and information on oil-field installations and stresses the introduction of the manufacturer's new, powerful engines to the drilling industry. *Caterpillar Tractor Co.*

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

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  A fit equal to a press fit. Tolerance of plus .000" and minus .000".
- Balanced Design
  Reduces overhand stresses 25%. Eliminates any weave or wobble.
- A Happy Sure-Grip Rim
  Makes required speed changes faster . . . safer . . . easier . . . cheaper. Maintains alignment. Hub element remains intact on shaft. Has no wearing parts to adjust. Requires no special tool. Is interchangeable with QD type sheaves.
- Happy Sure-Grip Sheaves with Happy Bull Dog V-Belts assure economical, dependable operation with low maintenance cost.

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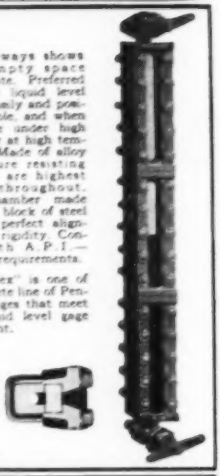

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REFINING

Quartermaster Corps Puts Mobile Oil Lab in Service

The Quartermaster Corps has put into service a mobile petroleum-testing laboratory for field testing of petroleum fuels and lubricants which is lightweight enough to be carried by air and which embodies all refinements developed since the end of World War II.

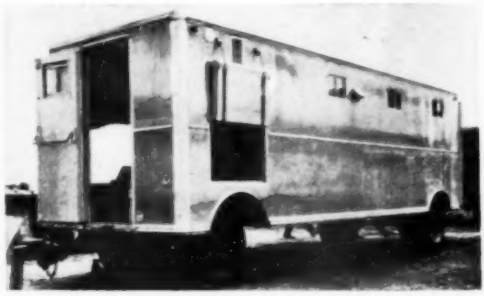
Unlike improvised mobile laboratories used in overseas battle areas, the new equipment is completely self-contained and independent of other sources for electrical power, heat control, or other requirements. Special equipment in the laboratory is capable of maintaining any critical range of temperatures necessary for precise analysis, including tests down to 100° F. below zero, and the unit is equipped to test all grades of gasoline, fuel oils, lubricating oils, and greases.

Due to use of so many different kinds of petroleum products during World War II, the corps realized the need for a mobile laboratory which would handle all testing requirements.

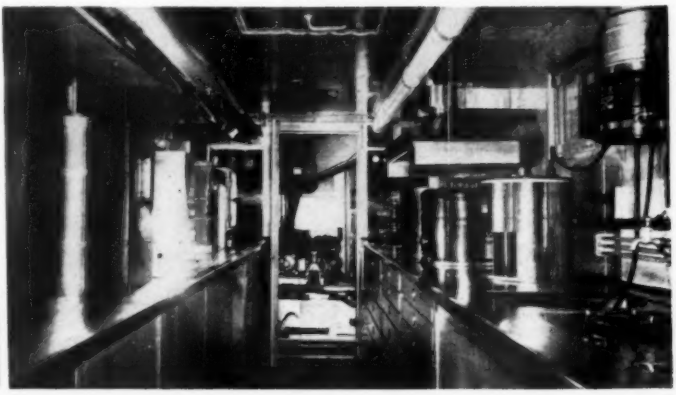
The pilot model, constructed on plans and specifications prepared by the Quartermaster Corps, is the first of four additional mobile laboratories to be built later. The new units to be manufactured will include further improvements indicated by field testing of the pilot model.

The laboratory is contained in a four-wheel trailer truck which is 25 ft. long, 8 ft. wide, 7 ft. 10 in. high, and weighs 11,000 lbs. fully equipped. An ingenious device facilitates raising the truck body to the level of the transport plane floor and dropping the wheel carriages for loading on the plane. Ordinarily the trailer would be drawn by truck.

The mobile unit houses two 4-kw. gasoline-driven electric generators, a gasoline-driven air-conditioning machine, blower and heater, air compressor, fuel and water tanks, as well as the latest apparatus for running petroleum-products tests.



New mobile petroleum-testing laboratory put in use by the Quartermaster Corps. Below, interior view showing facilities for testing all petroleum products in the field. The mobile lab can be transported by air since it weighs only 11,000 lb.



Cracking Unit to Be Built At Mount Vernon Refinery

A fluid catalytic cracking unit will be installed at Indiana Farm Bureau Cooperative Association, Inc.'s refinery at Mount Vernon, Ind., which will have a nominal capacity of 4,000 bbl. of fresh charge stock per day. It is being engineered and designed by Universal Oil Products Co., Chicago.

The addition of the cracking unit to the present facilities will enable the bureau to produce motor gasolines of higher quality and in addition, the unit, when operated with the present two-coil thermal cracker, will substantially increase the refinery's gasoline production. It is estimated that the projected operation will produce approximately 71 volume per cent on crude charge of 10-lb. R.v.p., 400° F. end-point gasoline.

Work Under Way on Cities Service Compounding Plant

Work is now under way on construction of a modern, $4,000,000 compounding plant at Cicero, Ill., for Cities Service Oil Co. (Del.), Contracts were awarded recently to Sumner S. Sollitt & Co., Chicago.

The new plant, located on a 42-acre tract of land on the east side of Cicero Avenue and abutting the Illinois ship canal, is designed to compound and blend more than 23,000,000 gal. of lube oils per day. Supplemental facilities will include a dock on the ship canal for receiving blending stocks; a laboratory, office, garage, boiler plant and storage tanks; and loading docks for both rail and transport facilities.

Blending stocks will be obtained from a solvent-refined lube-oil plant now being completed at Lake Charles, La., by Cit-Con Oil Corp., owned by Cities Service Co. and Continental Oil Co. These stocks will be barged up the Mississippi and Illinois rivers and connecting waterways, to the new facilities at Cicero. There they will be scientifically compounded and blended into lubricating oils.

The Cicero plant, which will be completed in July 1950, is a part of Cities Service's expansion program for the general Chicago and Great Lakes area. This project includes an $18,000,000 modernization program recently completed at its East Chicago, Ind., refinery, and a new technical-service laboratory also located at East Chicago.

Phillips' Kansas City Plant Sets Safety Record

The Kansas City refinery of Phillips Oil Co. has set a record of 2,000,000 consecutive man-hours without loss of time due to injuries to employes.

The last disabling injury was on June 24, 1948. W. A. McCarthy, plant superintendent, said that it was the longest accident-free period since Phillips began operations at the plant in 1930.

Fire Destroys Feeder Tank

A fire recently destroyed a 1,000,000-gal. feeder oil tank in the new deasphalting unit of Utah Oil Refining Co.'s Salt Lake City plant. Fire was followed by explosion but firemen quickly brought it under control, using chemicals. Company officials could make no immediate estimate of extent of damage.

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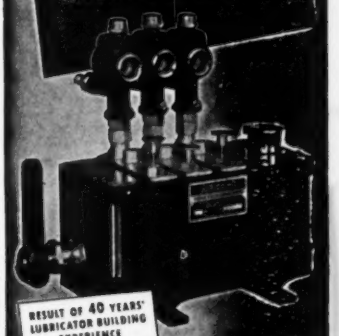

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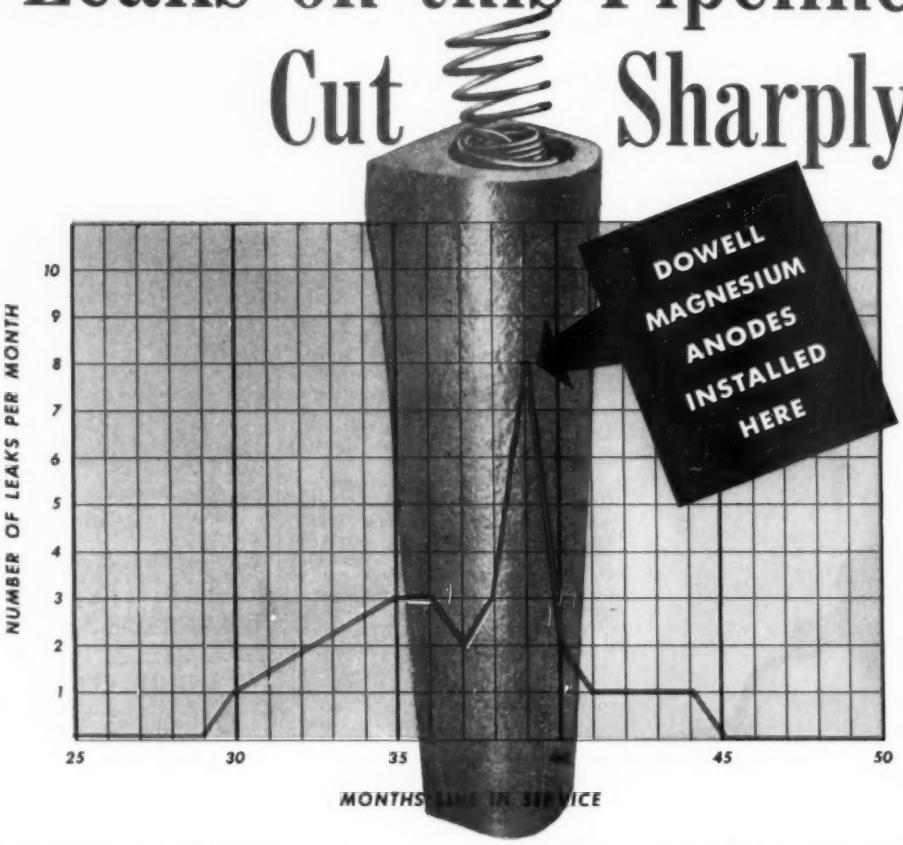
Leaks on this Pipeline Cut Sharply



The graph above shows the dramatic reduction in leak rate that occurred when Dowell magnesium anodes were installed on a 33 mile 8 inch asphalt covered pipe line. This installation saved thousands of dollars in maintenance costs alone, as well as extending indefinitely the time when the line would have to be reconditioned or replaced.

This is an example of the savings that can result when Dowell anodes are used to control corrosion on underground pipelines. The degree of protection afforded will depend upon soil conditions encountered and the number of anodes used. Easily and economically installed on existing pipe lines, Dowell magnesium anodes require no external power and cut maintenance costs to a minimum. Also, Dowell anodes are alloyed to specifications designed for maximum anode efficiency and long life.

A subsidiary of The Dow Chemical Company—pioneer in the use of magnesium for cathodic protection—Dowell offers the technical know-how and extensive research facilities which make it the logical source for magnesium anodes for corrosion control. Write directly to Tulsa for additional information.

DOWELL INCORPORATED
TULSA 3, OKLAHOMA

DOWELL

MAGNESIUM ANODES

GALVO-PAK • GALVO-LINE

SUBSIDIARY OF THE DOW CHEMICAL COMPANY

PIPE LINES

1,000-Mile Chicago Line Planned by Peoples Gas

PEOPLES GAS LIGHT & COKE CO., Chicago, has organized a new company, Texas Illinois Natural Gas Pipeline Co., for the specific purpose of constructing and operating a 1,000-mile or longer 30-in. line estimated to cost $100,000,000 from the Houston area to connections at Joliet, Ill., according to James F. Oates, Jr., chairman of Peoples Gas and Texas Illinois.

J. J. Hedrick, president of Natural Gas Pipeline Co. of America, another subsidiary corporation of Peoples Gas, is president of the new Texas Illinois company which will be operated by personnel of Natural Gas Pipeline Co. of America.

Within recent months control of Natural Gas Pipeline Co. of America and Texoma Natural Gas Co. has been acquired by Peoples Gas Light & Coke Co. subsequent to the granting of permission by the Federal Power Commission for buying the remaining stock of these two companies for a consideration of $32,668,000. This transaction has been consummated through purchase of stock from Cities Service Co. interests, The Texas Co., Sinclair Oil Corp., and Columbian Carbon Co. The stock amounted to 72 per cent of Natural Gas Pipeline Co. of America and 78.7 per cent of Texoma.

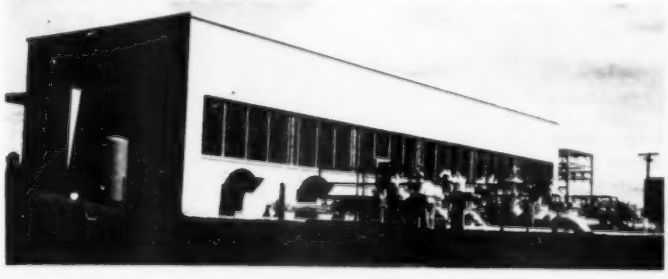
At an organizational meeting held in Chicago July 8, the directors of Texas Illinois authorized officers of the new corporation to apply to the Federal Power Commission at Washington, D. C., for a certificate of public convenience and necessity for building and operating the proposed pipe line. This will be done shortly.

Oates explained that Peoples Gas and its new auxiliary corporation are now negotiating to obtain natural-gas reserves in the Houston area. The negotiations have not been completed, he pointed out. He further stated that the necessary commitments have been obtained for pipe. If adequate gas reserves can be obtained and the necessary financing arranged, the availability of pipe should permit the construction of the line prior to earlier estimates which contemplated completion in 1953.

The big Texas Illinois project has been planned as the most important phase of the current program of Peoples Gas to meet increasing natural-gas needs in the Chicago area. Tentative engineering plans show that the new pipe line ultimately will be capable of transporting as much gas as the present combined output of the dual 26-in. and 24-in. transmission lines of the Natural Gas Pipeline Co. of America. These two lines bring the Chicago area's present natural-gas supply from the Panhandle and Hugoton gas fields of Texas and Oklahoma, delivering 484,000,000 cu. ft. of gas daily.

"Engineering studies," said Oates, "indicate that the new line will have an original daily capacity of approximately 340,000,000 cu. ft. which, by adding a series of compressor stations, can be increased to an ultimate 500,000,000 cu. ft. daily to meet rising demand."

A petition was filed at Springfield with the Illinois Commerce Commission requesting that permission be given Peoples Gas to invest $250,000 in the initial capital stock of the Texas Illinois Natural Gas Pipeline Co., which will be wholly owned by Peoples Gas. The initial $250,000 investment planned by Peoples Gas represents capital which the new corporation requires now to carry out preliminary engineering and survey work and other expenses in connection with the pipe-line construction



Guests of the Basin and Ozark Pipe Line Systems inspecting the Cushing, Okla., pump station immediately after the dedication ceremony on the station grounds, July 12

CRC

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LIKE TAPECOAT

It's easy to see why more and more distribution engineers are specifying TAPECOAT .. the modern pipe joint protection in tape form.

It's so quick and easy to apply ... wraps around the welded pipe joint like tape around a baseball bat.

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project. Until such studies have progressed further, the aggregate costs of the proposed line cannot be stated with accuracy.

Peoples Gas Light & Coke Co., with headquarters at 122 South Michigan Ave., Chicago, operates a system for distribution of gas in the Chicago area. Both Natural Gas Pipeline Co. of America and Texoma Natural Gas Co. have headquarters at 20 N. Wacker Drive, Chicago. Texoma operates the Texas end and Natural Gas Pipeline operates the section north of Texas for the existing system consisting of two lines of 24-in. and 26-in. pipe extending from Fritch in the Texas Panhandle to connections in the Chicago area.

Invasion Pipe Used on New Lone Star Gas Co. Line

Invasion pipe shipped to Galveston, Tex., by boat, and originally used during World War II in Belgium, is being used for part of the new 214-mile pipe-line system of Lone Star Gas Co., which will serve the company's new "Hill country" territory. Main-line construction was begun in mid-June by the firm's transmission division and crews began laying distribution lines in the first of 10 town plants which will be included in the new natural-gas area.

The new system extends south from Pottsville field west of Hamilton, Tex., to Lometa where it makes a junction and continues southeast and southwest as two parallel lines. The west leg, to be constructed of 8-in. pipe, will serve Llano, Fredericksburg, and Kerrville with a 6-in. tapline running northwest from near the Colorado River crossing to serve the town of San Saba. Goldthwaite, north of San Saba, will be served from a 4-in. tapline running 13 miles west from the Pottsville-Lometa 10-in. line on the north end of the new system.

The east leg will consist of 8 and 6-in. pipe, 8-in. from Lometa Junction to Lampasas and 6-in. from there south to Burnet and Marble Falls. A 4-in. tapline north of Marble Falls will serve the town of Bertram.

Following delivery of 114,360 ft. of invasion pipe, first construction was started on the 6-in. line north of Lampasas between that city and Lometa Junction. Another 116,720 ft. was delivered to Burnet and 77,820 ft. to San Saba on the west leg of the system.

Main-line construction is under supervision of Vaughan Sears, construction foreman.

Construction Is Delayed For East Tennessee Line

Construction on the East Tennessee Natural Gas Co. 398-mile, 3/16-in. project has been delayed because the Atomic Energy Commission has in-

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FOR
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● CLEVELANDS rugged unit construction and fine engineering cut maintenance cost to a minimum and permit quick, easy field repairs. Their low fuel consumption cuts operating cost to rock bottom.

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OF
EXPERIENCE

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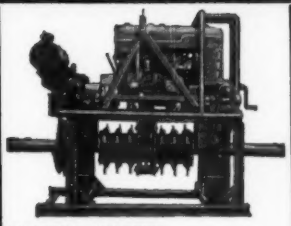
J. W. Sharman — R. P. Gregory

CROSE
MODEL M
CLEANING MACHINE



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with Crose pipe cleaning machines. Machines designed for pipe sizes from 2" to 30" diameter. Equipped for stationary or traveling operation. The machines with independent speed control on travel and priming head.

Standard models:

Model M—3" to 14" Pipe Cleaning machine
Model K—16" to 26" Pipe Cleaning machine
Cleaning and priming machines for larger pipe sizes also available.

Available on rental or outright sale basis.

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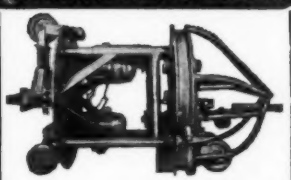
BRANCH OFFICE
M & M BUILDING HOUSTON, TEX.

CROSE
ELECTRIC MODEL
INTERNAL LINE-UP CLAMP



The electric model shown above is a rugged, heavy-duty clamp, electrically operated for the tough jobs.

ADVANTAGES:

For The Owners:
Better stringer bead; better finish weld; better pipe line.

For The Builder or Contractor:
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Rental or Outright Sale Basis

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MANUFACTURING COMPANY, INC.
MAIN OFFICE
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M & M BUILDING HOUSTON, TEX.

sisted that a line be built to Oak Ridge, Tenn., which would be the northern leg of the entire East Tennessee system. This would be constructed by N. A. Saigh Co. which has the contract for laying the pipe line for East Tennessee into Chattanooga and Knoxville, on which work is expected to start late this fall or early next year.

Difficulties have been reported in procuring pipe for construction which had been scheduled to be under way this summer.

El Paso Natural Considers New FPC Application

El Paso Natural Gas Co. officials are undecided on whether to file a new application to build a new pipe line to Arizona and California, according to reports.

The Federal Power Commission ruled yesterday that the company has not demonstrated that it can supply enough gas to serve proposed additional customers.

C. C. Cragin, vice president and general manager of El Paso Natural Gas, stated that a new well producing 16,000,000 cu. ft. of gas daily has been completed in the San Juan basin's Blanco field.

Texas Pipe Line Lays Corsicana-Chico Line

Texas Pipe Line Co. has let contract to Smith Contracting Co. for the laying of a 130-mile, 12-in. crude-oil line from Corsicana to Chico, Tex.

The Smith organization is moving in two spreads, one on each end of the line, which will work toward each other. The spreads are supervised by C. C. Craig and Robert Jones, superintendents. Field offices are being established at Corsicana and Weatherford, Tex.

United Gas Constructs Baxterville-Mobile Line

Work is now under way to prepare for the construction of a 90-mile, 20-in. line from the Baxterville field in Mississippi to Mobile, Ala., for United Gas Pipe Line Co.

Gathering lines in the field for feeding the system have been completed as well as all road and river crossings. O. C. Whitaker Co. has contract.

Texas Gas Laying Line

Work has started on construction of the 80-mile, 26-in. Spread 10 section for Texas Gas Transmission Co.'s 800-mile line to Middletown, Ohio. It is being laid by Midwestern Constructors, Inc., under supervision of R. C. Stanley, in Jefferson County, Indiana and Warren County, Ohio.

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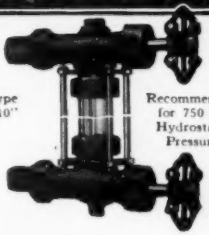
LIQUID LEVEL GAGES



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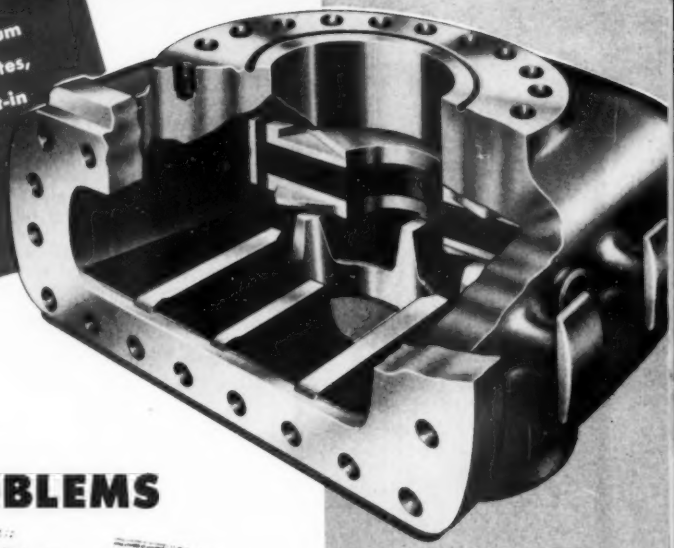
Mud problems are reduced to a minimum when you use Shaffer Cellar Control Gates, because these Gates have a unique built-in drainage feature that prevents the detrimental accumulation of mud and sand.



That's Why...

MUD PROBLEMS DRAIN AWAY from SHAFFER CELLAR CONTROL GATES

Take a careful look at the illustration above showing the bottom of a Shaffer Cellar Control Gate. Note the high narrow ribs which form the supports upon which the rams travel. These ribs are *narrow* so as to reduce to a minimum any chance of mud or sand gathering on the sliding surfaces. What little that might gather is quickly and easily wiped off by the rams as they open or close.

In addition to being *narrow*, these ribs are also *high* above the steeply-sloped bottoms of the Gate, thus holding the rams far above any mud or sand that might be in the bottom of the Gate.

Then to further minimize mud or sand accumulations, note how the bottoms of a Shaffer Gate have a steep inward pitch—a pitch that quickly drains mud and sand back into the well. And any that *does* remain in the Gate is easily flushed out by merely opening a valve connected to built-in wash-out ports—a quick, simple operation. *The rams are always ready for instant action whenever pressure emergencies threaten!*

And this mud-free construction is just one of *many* features you get in Shaffer Cellar Control Gates. From every angle—safety, simplicity, compactness, trouble-free maintenance and all-around dependable operation—your best protection is Shaffer Cellar Control Gates.

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Pages 3843 to 3894 of your 1948 Composite Catalog contain valuable information on the complete Shaffer line. Consult this section frequently!

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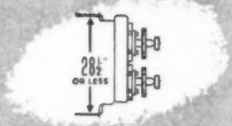

SPACE-SAVING COMPACTNESS: Less than 29 inches of cellar height for even such a large size as the 13⅝" Shaffer Double Cellar Control Gate—smaller sizes even less. Yet this Shaffer Double Gate contains *two* ram compartments—the lower equipped with rams for closing off open hole, the upper equipped with rams for closing off around the pipe!

EASY RAM CHANGES: Only ONE end cover need be removed to completely change rams in a Shaffer Gate. It's quick, simple, convenient!

PRESSURE-BACKED RAMS: As shown in the sketch an open passage permits the well pressure to build up behind the rams and this equalized pressure assists in the closing operation. The higher the pressure, the tighter the rams are sealed—*automatically!*

WIDE CHOICE OF POWER: Shaffer Gates can be readily operated with air, steam or electric power drives—*all coupled with the added protection of complete manual standby.* Moreover, the same Gate can be quickly changed from one type of power to another to fit the requirements of different rigs!

The above features are only typical of the *multiple* advantages built into Shaffer Cellar Control Gates. By all standards they are the outstanding equipment for modern pressure control operations!

Among the Drilling Contractors

Los Angeles Contractor Acquires Canadian Block

Pike Drilling Co., Los Angeles, has joined with Pacific Petroleums, Ltd., Calgary, Alta., Canada, in acquiring a 5,760-acre farmout from a major Canadian operator. The block, in which Pike has a 25 per cent interest, is a few miles south of Nestow, about 40 miles north of Edmonton. The acquisition marks Pike's first expansion into Canadian operations.

Doran Acquires New Rig

Paul Doran Drilling Co., Vandalia, Ill., has acquired a new Unit U-34 rig equipped with the recently developed General Motors torque-converted diesel engines. This is the first installation with these torque-converted engines to be placed in field operation. The rig has a rated capacity of 3,500 ft. with 4½-in. drill pipe.

Gaylord Drilling Co., Sapulpa, Okla., has the cable tool contract for a Wilcox sand wildcat test to be drilled for J. D. Taylor in the NW NE NW 17-23n-7w, northwest of Enid, Garfield County.

Thompson-Carr, Inc., Houston, is moving in rotary to drill Sinclair Oil & Gas Co. 1 T. P. Turner, an east offset to its 1 Sterling Williams, Ellenburger discovery in northwest Borden County, West Texas. Location is NW NW 46-32-6n-EL&RR. Contract depth is 10,000 ft.

ROTARY RIGS IN OPERATION*
(United States and Western Canada)

Area—	Week ended 7-11-49	Change week ended 7-4-49	Change week ended 7-12-48
Gulf Coast	530	—16	— 72
W. Tex.-N. M.	514	+ 3	— 84
Ark.-N. La.-E. Tex.	157	— 6	— 8
Oklahoma	228	— 7	— 68
Kansas	116	—10	— 19
Illinois, Eastern	129	+11	— 11
Rocky Mountains	106	— 4	— 57
Pacific Coast	177	—11	— 16
Total United States	1,959	—40	—335
Western Canada	66	+ 1	+ 13
Total	2,025	—39	—322

*Courtesy Hughes Tool Co.

Brinkerhoff Enters Canada

Brinkerhoff Drilling Co., Casper, Wyo., is joining the growing list of American drilling contractors operating in western Canada. Its first contract in that area will be for Westates Petroleum Corp. on a wildcat in the Tilley area, 120 miles southeast of Calgary, Alberta Province. The rig is being moved in from Kansas.

Jayhawk Drilling Co., Russell, Kans., is drilling for Vickers Petroleum Co. and itself at a new wildcat location in 23-20-6, Pawnee County, West Central Kansas.

Herndon Drilling Co., Carmi, Ill., is the contractor on Producer Pipe Line Co.'s new oil discovery well, 5 miles east of Ewing, in 16-5s-4e, Franklin

Lofland Brothers Co.'s day-tour crew on a wildcat test being drilled for Richfield Oil Co. near Monterey Park in suburban Los Angeles. Left to right: Dewey Pyles, Virgil Johnson, Earl Page, Charles Alford, and A. E. Bartels (driller)

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IT'S BETTER

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County, Illinois. The well is testing the O'Hara lime at 3,058-62 ft., from which it swabbed initially at the rate of 8 bbl. per hour.

Newman Brothers Drilling Co., San Antonio, is the contractor and joint operator with Alaska Steamship Co. and H. J. Smith in the drilling, just started, of an 8,000-ft. wildcat test in the R. S. Corder survey, Jack County, North Texas.

Wilson Drilling Co. has the contract for a Tuscaloosa test to be drilled for J. A. Harper Co. in 1-16n-8e, a mile south of the Delhi field in Franklin Parish, Louisiana.

C. E. Beal Drilling Co., Tulsa, is the contractor for Thompson Oil & Gas Co. on a 2,800-ft. test being started in the Ona pool, in 23-15n-11e, Okmulgee County, Oklahoma.

Makin Drilling Co., Hobbs, N. M., is opening a new oil pool for Southern Union Gas Co. at the latter's 1 State, 2-21s-37w, Lea County, New Mexico. The discovery well, located north of the Brunson pool, flowed initially at the rate of 268 bbl. per day from a depth of 6,774 ft.

Peterson Drilling Co., New Orleans, is starting a Smackover lime test for Delta Drilling Co. and W. W. Smith in 31-23n-6e, 1½ miles northwest of Beekman, Morehouse Parish, northeast Louisiana.

Woods & Cox Drilling Co. is starting a 6,000-ft. wildcat test for its own account in the RE&L survey, 3 miles east of Loving, Northeast Young County, North Texas.

Paul Nagel, Oklahoma City, has contracted to drill a 3,700-ft. exploratory test for Finston & Co., a newly organized company, in 24-27n-1e, Kay County, Oklahoma. The location is ½ mile from an abandoned gas well.

Roy Guffey Drilling Co., Dallas, is the contractor on a southeast extension well to the West Brock field in Carter County which is being drilled for L. O. McMilland and Yandell Rogers. Contract is for 4,550 ft.

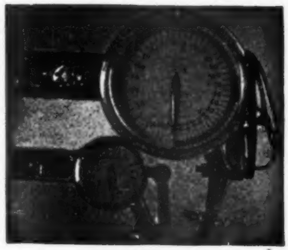
Lewis Drilling Co. has contracted with Anderson-Prichard Oil Corp. to drill 1-B Buss, NW SW SE 25-18-10, ½-mile southeastward extension test to the Orth pool in Rice County, Kansas.

Bert Fields Drilling Co., Dallas, has contract for Stanolind Oil & Gas Co. and Continental Oil Co. 1 Highland Lake Club, J. C. Post Survey, Harrison County, East Texas. Location is about ½ mile northwest of the same operators' 1 George Slaughter, gas-distillate discovery near Woodlawn, Tex.

Flournoy & Williams Drilling Co., Hoisington, Kans., is the contractor and part owner with El Dorado Refining Co. in the opening of a new oil pool in eastern Barton County, Kansas. The discovery well, 1-B Stumps, NW NW SE 24-18-11, 2 miles east of the Ames pool, recovered 2,550 ft. of oil on a drill-stem test of the Arbuckle at 3,284-99 ft.

Arrow Drilling Co., Tulsa, has the contract to drill a wildcat test for the Central-Del Rio group in the Huggett area, 7½ miles southwest of the Golden Spike field, southwest of Edmonton, Alberta Province, Canada. Specific location is LSD 15, 26-50-1w5.

LINE SCALES



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NATURAL GAS

Natural-Gas Line Permit Is Refused in Wyoming

The Wyoming Public Service Commission has refused a permit to Montana-Dakota Utilities Co. and Montana-Wyoming Gas Pipe Line Co. for an $8,419,880 natural-gas pipe line from Wyoming to Baker, Mont.

The commission said last week it had denied the joint application for the line because it believed it had no authority to grant the permit.

The two firms are planning a 340-mile line from Pure Oil Co.'s field in the Worland area in northern Wyoming, extending to Baker.

Dwight Dahlman, commission secretary, said movement of natural gas in the proposed line would be entirely interstate commerce, since the sale of gas at wholesale or retail prices is not planned in Wyoming. Consequently the line comes within the jurisdiction of the Federal Power Commission and not the state public service commission.

The firms also sought permission to build and operate a dehydration and sulfur-removal plant in Worland. At present natural gas from the field is being flared.

Construction at Half-Way Point on 26-In. Line

Construction of Cities Service Gas Co.'s 130-mile stretch of 26-in. line between Newton and Ottawa, Kans., approached the half-way mark recently, despite bad weather and heavy rock formations along the right-of-way, the company announced. On June 28 there were more than 55 miles of the new line completed and backfilled, 66 miles of ditch excavated, and more than 62 miles of pipe strung.

The firm also reported that the Arkansas River in Kansas which had been above flood stage for a number of weeks, the latter part of June was responsible for a break in the river crossing of the company's line near Hutchinson, Kans., on the Cunningham 8-in. line.

Gas-Purification Plant to Be Built at Rock Springs

Northern Utilities Co., Rock Springs, Wyo., has announced that it has contracted for a new gas-purification plant, to be constructed at the present plant site of the company at Rock Springs. A. M. Hafey, manager of the firm, said the plant will be the latest type and design.

The present purification equipment will be retained by Northern Utilities and operated in conjunction with the new plant.

Estimated cost of the new installation has been set at $50,000 and completion date is October 1 so the plant will be in operation for the coming winter season.

New Plant to Test Process To Remove Odor From Gas

Work was started recently on installation of a $35,000 pilot plant to test the processes for removal of mercaptans from Texas gas by Southern Counties Gas Co.'s Brea-Olinda, Calif., station on the Texas pipe line.

The plant, to be completed soon, will handle up to 2,000,000 cu. ft. of gas daily and is flexible enough to test any fixedbed process for removal of the mercaptans which cause an objectionable odor in the gas. The odor has been the cause of increasing leak complaints handled by the company's customer-service department since the Mid-Continent gas was introduced into the firm's system.

Four processes are slated for immediate testing, all of which have been tested previously in the laboratories at Santa Fe, N. M.

The pilot-plant project expects to furnish enough data on each process to make cost comparisons possible and also to furnish necessary data to design and engineer a full-scale plant if that is found necessary.

Permit Sought for New Gas Line by Eastern Natural

Eastern Natural Gas Corp., a newly formed organization, has filed application with Federal Power Commission for authority to construct and operate a 292-mile 24-in. natural-gas line, with approximately 200 miles of lateral line between Phoenixville, Pa., and Boston.

The application states that the new corporation plans to purchase its gas from unnamed existing transmission systems and sell to distributors to serve, among others, Norwalk, Danbury, Bridgeport, New Haven, Naugautuck, Waterbury, Meriden, New Britain, Hartford, and Middletown, Conn.; Providence, Woonsocket, Taunton, and Fall River, R. I.; and the following areas in Massachusetts: Springfield, Webster, Worcester, Lowell, Lawrence, Salem, and Boston.

Total cost of the project would be approximately $28,000,000, the company told FPC.

Natural Gasoline

Contract Awarded for New Compressor-Plant Addition

Contract has been awarded to Fluor Corp., Ltd., for the installation of additional gas-compression facilities at the Tomball gasoline plant, Humble Oil & Refining Co., to increase the existing plant-compressor capacity by approximately 10,000,000 cu. ft. per day. This compressor installation of 2,200-hp. should provide sufficient capacity to handle all casing-head gas production from both Humble and outside-operated leases. The casing-head gas will be compressed for processing in the existing high-pressure oil-absorption plant, and the residue gas will be delivered to the Tomball natural-gas system.

Additional facilities to be installed include a 1,000-hp. and a 1,200-hp. gas engine-driven compressor complete with auxiliary equipment including the necessary coolers, scrubbers, and pumps, and a new cooling tower large enough for the enlarged plant, replacing the present cooling tower. The suction pressure of the existing compressors is expected to be increased from 6 to 20 psig. for parallel operation with the new compressors. Gas will be compressed in three stages to the processing pressure of approximately 800 psi. No changes are contemplated in the absorption system. The work covered under the Fluor contract is expected to be completed in August 1949.

Contract Awarded for New Dollar Hide Field Plant

FORT WORTH.—Contract has been let to Hudson Engineering Co., Houston, for construction of a $6,000,000 natural-gasoline plant in the Dollar Hide field of Andrews County, R. B. Kelly, manager of Pure Oil Co.'s Texas producing division, said this week.

Compression facilities are expected to be in operation by January 1, 1950, and the complete 22,000,000 cu. ft. capacity plant is scheduled for completion by July 1, 1950.

The project is to be a joint operation with Pure Oil Co. as operators, and includes the following operators in the field: Magnolia Petroleum Co., Humble Oil & Refining Co., Union Oil Co. of California, Lion Oil Co., Pacific Western Oil Corp., and from Oklahoma City, F. G. Blackwood, John W. Nichols, and W. W. Whiteman, Jr.

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Exploration and Drilling

Reef Trend Search on West Flank of Bend Arch

FOR some time an active interest has been displayed in possibilities of developing a Pennsylvanian lime reef trend in West Central Texas to connect up Round Top field in northeast Fisher County with Jameson field of northwest Coke County. One of the wells that was being watched closely was Skelly Oil Co. 1 E. A. Ater, 330 ft. from north line and 2,500 ft. from the west line of 67-23 T&P Survey, about 3½ miles southwest of Rosco, in the northwest part of Nolan County.

This well was started as an Ellenburger test, on a block picked up on the basis of subsurface data, checked by core drill, and finally shot with seismograph. However, as it was pretty much in line with at least some of the projected reef trends, it was watched for developments in the Pennsylvanian.

While not all tops have been released, the log has been, and the dope indicates that no Canyon reef was found; in fact about the only lime section other than a few stringers, was about 200 ft. in the Cisco, topped at about —2,426 ft.; the Canyon and Strawn sections were almost entirely shale. This test of course is too far east for the eastern shelf area of the Midland basin, being instead down on the west flank of the Bend arch.

However, the test is interesting enough as an Ellenburger venture. The section of Ellenburger present is probably entirely different from that which produces in the Midland basin and on the Central platform to the west. The nearest Ellenburger production of any consequence associated with the Bend arch lies quite a distance east in Throckmorton and Shackelford counties.

The well is now swabbing mud and fluid through tubing, after setting 5½-in. pipe, perforating and running tubing. The Ellenburger was topped at 7,086 ft. (—4,642 ft. datum), and had several drill-stem tests which recovered oil, but no flows. Casing is cemented at 7,155 ft., total depth, and pipe was perforated at 7,090-7,100 ft. After swabbing out drilling fluid and cleaning up, the chances are the well will be acidized before final results can be evaluated.

Tops, other than Ellenburger given above, which have been released are: Blaine +1,439 ft.; San Angelo +984 ft.; Bullwagon +394 ft.; Valera +99 ft.; Wolfcamp —1,146 ft.; Dotham —1,628 ft.; and Noodle Creek —1,718 ft.

Core reports are: 7,097-7,105 ft., recovered 8 ft. fractured dolomite with chert nodules, good oil odor, staining and fluorescence; 7,115-20 ft., recovered 4 ft. fractured dolomite with chert bands, good oil odor, staining and fluorescence; 7,120-30 ft., recovered 9½ ft. fractured dolomite, chert bands, some staining in top, and fluorescence; 7,130-55 ft. total depth, recovered 22 ft. in two cores, mostly banded dense, tight dolomite, no fracturing, no staining, fine chert bands, but bottom 3 ft. showing cavernous porosity with sulfur odor.

A drill-stem test at 7,087-97 ft., open 4 hours, recovered 28 ft. of oil, 92 ft. of oil-cut mud. Test at 7,089-7,105 ft., open 4 hours, had some gas, recovered 6,225 ft. of oil, 160 ft of oil and gas-cut mud, no water, gravity of oil 43.3°. Test at 7,090-7,115 ft., open 7 hours, gas in 50 minutes, recovered 5,790 ft. of oil and mud-cut oil, bottom 270 ft. black drilling water. Test at 7,108-20 ft., open 6 hours, recovered 540 ft. of oil, 120 ft. of heavily oil and gas-cut mud, no water. Test at 7,130-55 ft., open 2 hours, recovered 1,670 ft. of sulfur water.

Charles J. Deegan.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

WEST CENTRAL TEXAS.—Sweetwater Exploration Co. 1 Davis, 165-1A-H&TC, 15 miles south of Sweetwater, topped the reef lime at 5,544 ft., and drill-stem tested from 5,546-60 ft. Gas surfaced in 55 minutes and in 1 hour the recovery was 30 ft. of free oil, plus 120 ft. of heavily oil and gas-cut mud. Operators drilled ahead after the test.

WEST TEXAS.—Superior Oil Co. 1 Dockery, northwestern Mitchell County Ellenburger discovery, was waiting on storage for completion tests. Various field reports credited the well with making up to 60 bbl. of oil in 1 hour.

ROCKY MOUNTAIN AREA.—Shows were found in the Mississippian (?) at Big Flat, Grand County, Utah, by Tide Water Associated Oil Co. 74-11, and operator is drilling below 7,755 ft. General Petroleum Corp. is running casing for further tests on the 37-X-24-G, South Frisby, Washakie County, Wyoming, wildcat. Shows were found in the Phosphoria. Continental Oil Co. and Pure Oil Co. announced location for a slim-hole strat test in Burleigh County, in North Dakota's Williston Basin.

CANADA.—Recovery of black oil at four wells in west central Saskatchewan confirmed the discovery of a new pool 8 miles north of Maidstone. The wells, drilled by an independent team of Caldough and associates, produce from the lower Cretaceous, and are comparable to the better wells in Lloydminster pool, 15 miles to the west.

NORTH CENTRAL TEXAS.—The highest completion flow to date for the McGregor area of Archer County was at L. T. Bobby Burns 3 McGregor, which made 125 bbl. of oil in 2½ hours, extending Vogtsberger pay ¾ mile to the northwest. Location of the well is approximately ¾ mile southeast of production from the same pay in Priebe field.

SOUTH LOUISIANA.—Humble Oil & Refining Co.'s B-5 Burguires Co., Ltd., found a new pay on the southeast flank of Weeks Island Dome, Iberia Parish.

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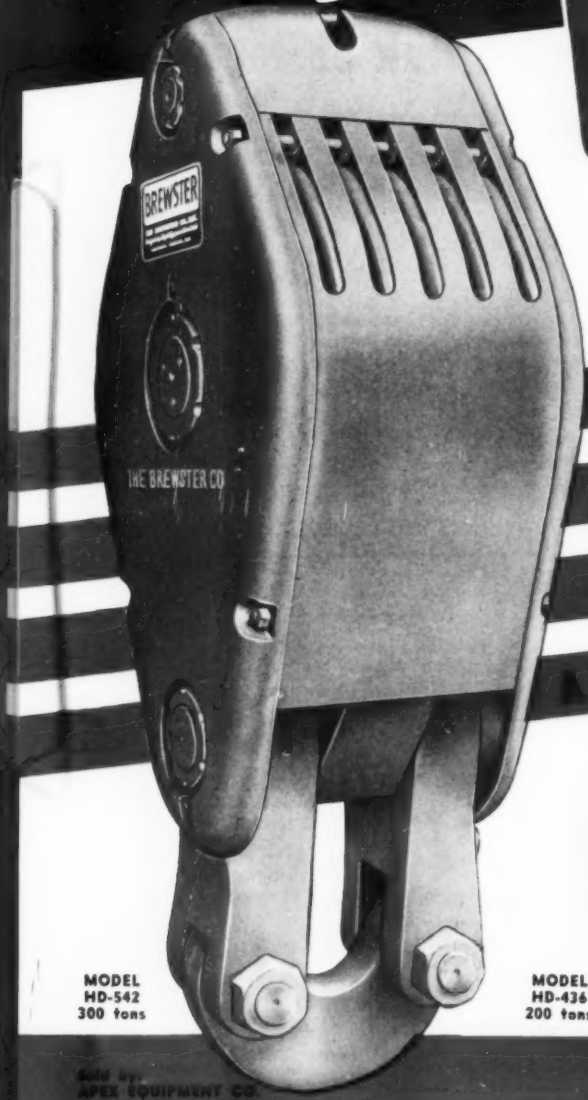

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N. CENTRAL TEXAS

Archer Test Gets Area's Highest Completion Flow

WICHITA FALLS.—In Archer County, 8 miles south of Wichita Falls, L. T. and Bobby Burns 3 McGregor, Section 4, Block 1, H&TC Survey, made the area's highest completion flow when it flowed 125 bbl. of oil in 2½ hours. Pay is from the Vogtsberger sand at 4,649-62 ft.

Location of the new well may connect the field with Priebe pool. It extended Vogtsberger pay ¾ mile northwest of the McGregor area, and is about the same distance southeast of production from the same zone in Priebe field.

Burns 5 McGregor, 100 ft. east of the 3 McGregor, completed for a calculated daily potential of 301 bbl. of 42°-gravity oil, when it gaged 112.8 bbl. in 9 hours. Completion was from the field's upper pay zone, from 3,855-62 ft. The well extends production from that zone 2,000 ft. to the northwest.

New exploratory work for Archer County included the following: Fain & McGaha 1 C. E. Reams, Block 103, J. W. Harris Survey, 3½ miles northwest of Archer City. Contract depth is 4,400 ft. Akin & Dimock 2 R. Campbell, 6,000-ft. rotary test in Section 1,811, TE&L Survey, 4 miles northeast of Olney, had drilling under way. Location is about 2 miles west of production. George W. Graham located 1 J. T. Gant 660 ft. from north and 330 ft. from west lines of the J. F. Gant Survey. The 4,800-ft. test will be a south outpost to McGregor Ranch field.

Nolan County.—Skelly Oil Co. 1 E. A. Ater, 67-23-T&P, Ellenburger prospect, 5 miles southwest of Roscoe, found the water table in drill-stem testing from 7,130-55 ft., total depth. Recovery in 2 hours was 6,800 ft. of sulfur water, with no shows of oil or gas. The well had previously recovered clean oil on four drill-stem tests from 7,087-7,120 ft.

Jack County.—Jack Grace Production Co. 1 T. H. Cherryhomes, Ellenburger test in the T. Henry Survey, 2 miles northeast of Cundiff, and 2½ miles northwest of a Caddo well, had total depth in conglomerate at 5,868 ft. Operators were drilling plug on 5½-in. casing set to 5,858 ft. The conglomerate had 10 ft. of oil show from 5,858 ft.

Russell Maguire 1 R. E. Kelsay, B. B. Straughn Survey, 3½ miles southwest of Stewarton, extended conglomerate production approximately 1 mile south of a new conglomerate field. The well flowed 235 bbl. of 43°-gravity oil a day, through 16/64-in. choke, from pay at 4,568-82 ft., total depth. Casing pressure was 700 psi., and gas-oil ratio was 750 cu. ft. Completion had been delayed several weeks due to lack of storage.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) SUCCESSFUL WILDCATS

Baylor County: M. W. Blair 1 Mrs. D. S. Portwood, Sec. 1280, TE&L Sur., 3½ mi. SW Megargel, pumped 15 bbl. oil a day, pay 1,391 ft., TD 1,399 ft.

Coleman County: H. E. White 1 W. K. and Lulu Terry, T&NO Sur. 69, 2 mi. N Taylor, pumped 84 bbl. 43°-grav. oil a day, Palo Pinto 3,608-3,115 ft., GOR 400 cu. ft., TD 3,147 ft.

Stephens County: McElroy Ranch Co. 1 R. W. Tipson, 5-8-T&P Sur., 15 mi. NW Breckenridge, flowed 250 bbl. 42.5°-grav. oil a day, pay 4,242-4,642 ft., 11/64-in. choke, GOR 550 cu. ft., CP 960 psi., TP 700 psi., Caddo 3,515 ft., Marble Falls 4,050 ft., Ellenburger 4,599 ft., elev. 1,200 ft.

Taylor County: J. P. Production Co. 1 N. V. Atwood, NW NW NE 132-acre tract, Sec. 433, J. C. Thompson Sur., 2½ mi. SW Lawn, flowed 75 bbl. 39°-gravity oil a day, Strawn 4,103-21 ft., TD ¼-in. choke, GOR 565 cu. ft., TP 100 psi., CP 300 psi.

Throckmorton County: James H. Snowden 1 G. D. Dicike Unit 1, Sec. 686, TE&L Sur., ½ mi. SW Woodson, flowed 125½ bbl. 41°-gravity oil in 4 hr., ⅜-in. choke, Mississippian 4,513-21 ft., GOR 675 cu. ft., CP 650-375 psi., TP 800-525 psi., TD 4,351 ft. Rerun for corrected pay formation.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) WILDCAT FAILURES

Archer County: Paul Atchley 1 Katherine Atchley "B," Sec. 5, BBB&C Sur., 5 mi. NW Olney, dry, TD 1,217 ft., Gunsight lime 1,137 ft.

Woffard Cain 1 Virgil Seay, Blk. 56, J. W. Harris Subd., 8 mi. W Archer City, dry, TD 4,885 ft.

Brown County: W. K. Massey 1 Keller, Blk. 15, White Sur., 3 mi. SE Burkett, dry, TD 406 ft.

Coleman County: K. C. Bates 2 J. L. Henderson, Mary McCarty Sur. 167, 3 mi. SW Burkett, dry, TD 979 ft.

Con Oil Co. 1 Rich, Blk. 5, League 181, Comal CSL, 8 mi. SW Cross Plains, dry, TD 1,109 ft.

Comanche County: Bankline Oil Co. 2 Callaway, Sec. 60, D&DA Sur., 4½ mi. E Rising Star, dry, TD 3,372 ft., Caddo 2,390 ft., Mississippi 3,329 ft., Ellenburger 3,349 ft., elev. 1,493 ft.

Cooke County: Russell Maguire 1 Matt Nue, R. E. Shannon Sur., 4 mi. SE Myra, dry, TD 1,950 ft., Ellenburger 1,916 ft.

Hamilton County: The American Liberty Oil Co. 1 Bywaters-Hensford Ranch, J. P. Whatt Sur., 3 mi. E Hamilton, dry, TD 3,855 ft., Ellenburger 3,812 ft.

Jack County: Mid-Continent Petroleum Corp. 1 J. F. Boyd, S. H. Hazel Sur., 3 mi. S Post Oak, dry, TD 3,878 ft.

Mora Drilling Co. 1 W. R. Hill, BBB&C Sur., 8 mi. SE Antelope, dry, TD 4,992 ft.

Jones County: Hickok & Reynolds, Inc., 1 Z. E. Boaz, W. S. Coulson Sur. 212, 10 mi. SW Anson, dry, TD 3,311 ft.

Neeld & Hood 1 J. B. Pruitt, Sec. 29, OAL, 6 mi. E Anson, dry, TD 3,515 ft., base Saddle Creek 2,118 ft.

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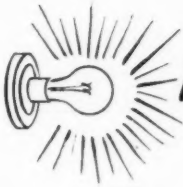

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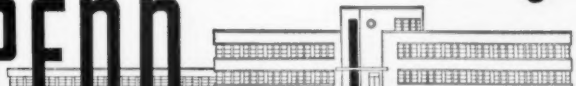

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Lampasas County: G. E. Owen 1 Cora G. Stanley, Lot 12, L. H. W. Johnson Sur. 46, dry, TD 572 ft., Marble Falls 190 ft., Barnett 445 ft., Chappel lime 478 ft., elev. 1,120 ft.

Trockmorton County: S. D. Johnson 1 Susie Tuton, W. N. Irwin Sur., 9 mi. W Woodson, dry, TD 4,736 ft., Caddo 4,077 ft.

Wichita County: Fortex Oil Corp. 1 George Streit, Blk. 317, Waggoner Co. Subd., 8 mi. NE Electra, dry, TD 2,431 ft.

G. E. Kadane & Sons 1 R. J. Bradley "A," M. L. Gahagan Sur., 2 mi. N Kadane Corner, dry, TD 1,845 ft., Gunsight lime 1,876 ft.

Frank Wood 1 W. T. Waggoner "S," Sec. 14, HT&B Sur., ¼ mi. S Electra, dry, TD 2,206 ft., light oil show 820-825 ft.

Wilbarger County: G. E. Kadane & Sons 1 W. T. Waggoner "D," 20-5-H&TC, 5 mi. SW Electra, dry, TD 3,106 ft.

Young County: Pace & Strange 1 G. L. Stewart "McGee," D. Dawson Sur., 2 mi. NE Farmer, dry, TD 4,465 ft., Caddo 4,362 ft.

OKLAHOMA

Mid-Continent Makes Well In Okfuskee County Wildcat

OKFUSKEE County has another new pool where Mid-Continent Petroleum Corp. is completing its 1 Weehunt, NW SE SE 6-11n-11e, in the second Wilcox sand. Pay was topped at 3,752 ft. and drilled to 3,760 ft. with casing at 3,715 ft. In an early test, the well flowed naturally 125 bbl. oil with 300,000 cu. ft. of gas in 24 hours. Shot with 10 qt., it then swabbed 115 bbl. in the first 15 hours. The discovery is about 1 mile southeast of the Blakely pool and has been designated as the Southeast Blakely pool. Operators already have staked location for 2 Weehunt, a 10-acre north confirmation test, in SW NE SE of the same section.

In Hughes, the adjoining county to the south, Mid-Continent Petroleum Corp. and Otha Grimes have another prospective new pool in their 1 McCosar, SW SW NE 14-8n-10e, which flowed at an estimated 10,000,000 cu. ft. of gas per day and recovered 150 ft. of oil and 30 ft. of salt water in a drill-stem test at 3,256-93 ft. Casing has been run to the top of the pay for completion. The new well is about 1½ miles north and west of production in the Greasy Creek district.

Extending the Elk City field of Beckham County 1½ miles eastward into Washita County and confirming results of previously reported drill-stem tests, E. Constantin, Jr., has completed his 1 Lambert, C SW SW 18-10n-20w, flowing 728 bbl. of oil and 2,000,000 cu. ft. of gas in 19 hours through ½-in. top and ⅝-in. bottom chokes. Production is from casing perforations at 9,849-54 ft. Hole was drilled to 10,429 ft. and plugged back to 9,885 ft. with 5½-in. casing at 10,409 ft.

Between this well and the main part of the field and about a mile from production, Wilcox Oil Co. 1 Walker, C SE NW 24-10n-21w, is virtually assured of making a producer as preparations are made to test. It has 7-in. oil string run with total depth of the hole at 10,120 ft. Its completion will make nine producers for the field, in which 12 active operations are now under way.

One mile east of the small Munger pool in Oklahoma County, An-Son Petroleum Corp. 1 John McVickers, C NW NW 7-12n-1w, appears to be a good gas and distillate well in Bartlesville sand at 6,044-55 ft. It is testing through 1-in. choke. No gage has been reported. Production is from open hole with 7-in. casing at 6,041 ft. Powel Briscoe and F. C. Hall are moving in for

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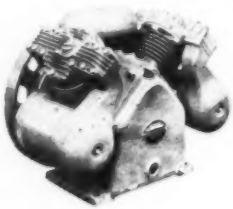

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NOTICE TO ALL OIL COMPANIES

The California Division of Fish and Game has opened, for seismic explorations, that portion of the coast lying between Point Conception and the northern limits of the city of Santa Barbara, known as Area 7, for a period of ninety days beginning August 1, 1949, and the areas around Santa Barbara, San Clemente and San Nicolas islands, known as areas 13, 14 and 15, respectively, for a period of ninety days beginning July 1, 1949. These areas will not be opened again prior to January 1, 1952.

Explorations in each area will be carried out jointly by several companies. Any oil company wishing to participate in the joint explorations in any of the above areas must so notify

Mr. J. B. Hudson
Humble Oil and Refining Company
612 South Flower Street
Los Angeles 14, California

on or before July 24, 1949. No request for participation in the work will be considered if the application has not been received prior to midnight, July 24, 1949.

Signed
R. S. Croker, Chief
Bureau Marine Fisheries
June 24, 1949

a south offset at their 1 S. J. Weaver, C SW NW 7-12n-1w.

Stanolind Oil & Gas Co. 1 Richardson Unit, SW SE NE 1-1n-1w, a mile north of the North Hoover pool, Garvin County, swabbed 20 bbl. of 35° oil in 12½ hours through 2½-in. tubing with casing perforated at 4,532-50 ft. and 4,573-89 ft. During the last 4 hours of the test it made 2 bbl. per hour with production increasing

OKLAHOMA SUCCESSFUL WILDCATS

Carter County: Sun Oil Co. 1 Miller, SW SE NW 8-1s-3w, flowed 126 bbl. of 37.5°-gravity oil per day from sand at 5,908-83 ft., TD 6,586 ft.

Mid-Continent 1 Vaughn, SE NE NW 15-5s-1w, pumped 61 bbl. of 37.5°-gravity oil per day from Lone Grove at 4,484-4,502 ft. and 4,125-41 ft., TD 4,609 ft.

Comanche County: Bond Oil 1 Choens, SW SE SW 31-4n-10w, flowed 8 bbl. of 34°-gravity oil per day from sand at 617-805 ft., TD 1,002 ft.

OKLAHOMA WILDCAT FAILURES

Carter County: Sullivan 1 Margo, SE SE SW 17-4s-3w, dry, TD 760 ft.

Cimarron County: Bay Petroleum 1 Lively, C NE NE 15-4n-6ecm, dry, TD 5,380 ft., Keyes 5,280 ft., Mississippian 5,320 ft.

Cotton County: Albritton 1 Tabby-To-Show-It, SW SW SW 34-2s-12w, dry, TD 1,922 ft., Megargle 1,943 ft.

Wilcox 1 Hutton, SW SW NE 28-3s-9w, dry, TD 4,330 ft.

Wilcox 1 Henderson, N/2 SE 14-3s-11w, dry, TD 2,016 ft.

Blair 1 Sellers, NW SW SW 27-3s-11w, dry, TD 1,655 ft.

Benton Ross 1 Baldwin, NE NE SW 14-5s-12w, dry, TD 1,871 ft., sands 1,285-95 ft., and 1,425-43 ft., sandy shale 1,526-72 ft., fusilinid lime 1,688 ft., broken Thomas sand 1,728-68 ft., Megargle 1,852-60 ft

Garvin County: Myers et al 1 Jones, W/2 NE SE 15-4n-1w, dry, TD 4,574 ft., limy conglomerate 4,514 ft., sand 4,544-56 ft with show of oil.

Grant County: Cities Service Oil 1 Wirtz, NE SE NE 31-29n-3w, dry, TD 5,040 ft., Tonkawa sand 3,304 ft., Layton 3,669 ft., Big lime-Oswego 4,030 ft., Mississippi chat 4,499 ft., Mississippi lime 4,542 ft., Woodford 4,900 ft., Viola 4,961 ft., Wilcox 4,996 ft.

Hughes County: Rapp 1 Olive, SW NW NE 5-5n-8e, dry, TD 2,530 ft., Senora lime 1,145 ft., Senora sand 1,152-1,250 ft., brown lime 2,295 ft., Booch sand 2,506-13 ft.

Jefferson County: Bridwell 1-A Barrett est., NE NW NW 15-6s-6w, dry, TD 2,075 ft., sand 1,037-51 ft., white sand 1,125-91 ft., no shows.

Lincoln County: Slagter 1 Duke, NE SE NE 19-13n-4e, dry, TD 5,369 ft., Checkerboard 3,339 ft., conglomerate 3,377 ft., Oswego 4,091 ft., Prue 4,118 ft., Verdigris 4,204 ft., Skinner sand 4,323 ft., lime 4,395 ft., Red Fork 4,484 ft., Inola 4,5531 ft., lime 4,644 ft., Mayes 4,789 ft., Woodford 5,039 ft., Hunton 5,094 ft., Sylvan 5,105 ft., Viola 5,198 ft., Wilcox 5,273 ft., second Wilcox 5,328 ft.

Hubbell & Webb 1 Gertsen, NE SE NE 12-15n-5e, dry, TD 4,393 ft., Pure 3,238 ft., Misener 4,098 ft., Hunton 4,125 ft., Viola 4,218 ft., Wilcox 4,266 ft., second Wilcox 4,298 ft.

Logan County: Mohawk Drilling 1 Hardeman, NE NE NW 23-17n-1e, dry, TD 5,059 ft., Oswego 4,172 ft., Prue 4,298 ft., Verdigris 4,336 ft., Skinner 4,423 ft., lime 4,453 ft., Red Fork 4,467 ft., Bartlesville 4,559 ft., Mississippi lime 4,577 ft., Woodford 4,609 ft., Bois d'Arc 4,646 ft., Sylvan 4,750 ft., Viola 4,836 ft., dense 4,860 ft., dolomite 4,896 ft., Wilcox 4,920 ft., second Wilcox 5,057 ft.

Noble County: Derby Oil 1 School Land, SE NW NW 16-21n-2e, dry, TD 4,562 ft., Layton 3,108 ft., Mississippi lime 4,301-95 ft., Viola 4,441 ft., Wilcox 4,508 ft., Marshall 4,521 ft.

Okmulgee County: Manhart 1 McEwan-Gill, SE NE NE 34-14n-11e, dry, TD 3,114 ft., Hominy 3,103 ft.

Osage County: Jack et al 1 Osage, SE SE SW 20-26n-12e, dry, TD 1,744 ft.

Pawnee County: O'Rourke-Baker 2 Griesel, NE NE NW 3-21n-5e, dry, TD 3,226 ft., Avant 1,980 ft., Hogshooter 2,240 ft., Layton 2,300-2,410 ft., Checkerboard 2,580 ft., conglomerate 2,630-2,720 ft., Peru 2,740-2,815 ft., Oswego 2,815-2,980 ft., Prue 2,980 ft., Verdigris 3,028 ft., Skinner 3,125 ft., lime 3,140 ft., Burbank 3,165 ft.

Pontotoc County: Bass et al 1 Burkhart, NE SE SE 18-3n-4e, dry, TD 2,000 ft., Viola 1,336 ft., dolomite 1,341 ft., first bromide sand 1,424 ft., second bromide sand 1,724 ft.

Pottawatomie County: Pardee 1 Farr, NW NW NW 23-7n-2e, dry, TD 5,750 ft., Belle City 3,190 ft., Hogshooter 3,590 ft., Checkerboard 3,850 ft., Woodford 4,825 ft., Hunton 4,915 ft., Sylvan 5,217 ft., Viola 5,323 ft., Trenton 5,378 ft., dolomite 5,441 ft., brown lime 5,540 ft., Wilcox 5,622 ft.

Pushmataha County: Lott 1 Lott Block, SE SE NE 26-1n-17e, dry, TD 70 ft.

Seminole County: Smith 1 Hart, NE SW SW 22-10n-2e, dry, TD 6,028 ft.

SOUTHWEST TEXAS

Semiwildcat in Cameron County Is Testing

CORPUS CHRISTI.—Sidney H. Smith, Jr., is testing his 1 O. W. Johnson, semiwildcat outpost test near Lacy field east extension, Cameron County, for completion as an oil producer, which would signal the opening of a new field, since the east extension to Lacy field produces gas condensate. Total depth of the hole is 7,550 ft., with 5½-in. casing set on bottom. Drillstem test run at 7,536-48 ft. prior to setting pipe recovered 600 ft. of pipe-line oil through ¼-in. chokes, in 11 minutes, and developed 275 psi. working pressure.

I. K. Howeth's 1 Garza, wildcat, approximately 1 mile southeast of oil production

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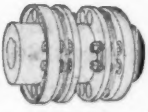

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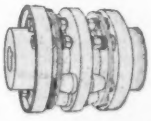

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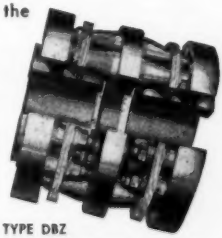

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at Lockhart field, Starr County, has indicated production on initial test from perforations at 4,032-32½ ft. The well was drilled to total depth of 4,039 ft., with 5½-in. casing set on bottom. On 15-minute drill-stem test at 4,026½-34½ ft., it recovered 400 ft. of pipe-line oil and developed 885 psi. working pressure. The well flowed a little 40.2°-gravity oil through ¼-in. choke, recovering 46°-gravity oil in the tool.

Location has been made for Union Producing Co. 1 Virginia H. Taton, wildcat, to be drilled to 13,000 ft., in the John Durst Survey, A-51, Aransas County.

Taylor Refining Co. R-2 Parr, wildcat 1 mile east of Agua Prieta field, Duval County, has been completed a producer. The well flowed 71 bbl. of 48.3°-gravity oil per day through 9/64-in. choke. Along with it was completed the R-3 for 69 bbl. of oil per day through 9/64-in. choke through perforations at 4,284-90 ft.

SOUTHWEST TEXAS (DISTRICTS 1 & 4)
WILDCAT FAILURES

Bexar County: Bernard B. Raisen 1 Lilliam B. Ridder, in Jose M. Becerra Sur., 12 miles southwest of San Antonio, dry, TD 936 ft.

Cameron County: T. S. Scibienski 1 Lloyd M. Bentsen et al, in Espiritu Santo Gr., 2½ miles northeast of Monte Grande, dry, TD 10,128 ft.

Duval County: Cox & Hamon and Geo. H. Coates 1 G. W. Sutherland-Homestead, in SA&MG Sur. 7, A-534, 3½ miles north of Poquita Creek field, dry, TD 2,303 ft.

Delhi Oil Co. 1 Hagist Ranch, in BBB&C Sur. 1, 3 miles north of Eagle Hill field, dry, TD 7,000 ft.

Guadalupe County: J. S. & W. A. Swearingen 1 Robert Lowman, in Geo. Allen Sur. 17, 1½ miles north of Staples, dry, TD 736 ft.

Jim Hogg County: Ryan, Hays & Burke and Jergins Oil Co. 1 Vela Pena, 3 miles southwest of Las Animas field, dry, TD 3,149 ft.

McMullen County: Newman Bros. Drilling Co. & Alaska Steamship Corp. B-12 South Texas Syndicate, Inc., in E. M. Beall Sur. 26, A-590, 1 mile southwest of Greens Ranch field, dry, TD 4,044 ft.

Medina County: J. E. Mowinckle & H. E. Nessly 1 Hy. Mofield, in L. Frery Sur. 112, A-1555, 3 miles north of Yancey, dry, TD 1,975 ft.

Nueces County: Callery & Hurt and H. R. Smith 1 J. S. Harlan, 2½ miles northwest of Driscoll, dry, TD 8,038 ft.

Webb County: O. W. Killam 72 Bruni Est., 4 miles south of Bruni, in M. Arispe Gr., dry, TD 3,094 ft.

Williamson County: Tra-Tex Oil Corp. 1 Brecker-Brinckmeyer, in Phneus Stoddard Sur., 6 miles southeast of Taylor, dry, TD 1,627 ft.

Zavala County: A. J. Bankhead 2 Paul Alley, in GWT&PRR Sur. 14, A-815, 5 miles north of Batesville field, dry, TD 3,865 ft.

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CANADIAN FIELDS

New Black Oil Discovery In Saskatchewan

CALGARY.—Eastern Canadian independent oil interests have a new black oil discovery located 8 miles north of Maidstone, in west central Saskatchewan. Initial performance of four completions in the new pool is comparable to that of the better-than-average wells in Saskatchewan's Lloydminster and Lone Rock black oil pools, 15 to 24 miles to the west, along the Alberta border.

Wallie Caldough and associates drilled 1 Caldough and cased it early in June, in Section 15-49-23w3. Numbers 2, 3, and 4 were also drilled on the same section and cased to total depth, in the Lower Cretaceous, around 1,600 ft. Early this month the cement plugs were drilled, with results being highly favorable.

The No. 4 well, like some Lloyd wells, had enough gas to flow heavy oil under its own power temporarily. This well during 24 hours on test, flowed somewhere between 350 and 400 bbl. of gasified oil. Gravity of the oil is 13° to 15° A.P.I.

The No. 2 well, starting off as a pumper, made over 100 bbl. of crude in 24 hours. Numbers 1 and 3 wells are currently being readied for the pump test.

Tawatina.—A few miles southeast of Tawatina, 45 miles north of Edmondton, 4 Redwater Consolidated wildcat blew wild for 10 hours before crew were able to get the natural-gas flow under control. The well, located in LSD 4, 8-61-23w4, lost circulation at depth 3,597 ft. and then blew out. Source of the gas is unknown, but could be from the Viking sand or from sands in the Lower Cretaceous. A protective string of 7-in. casing is now being run, prior to carrying the well down for a test of Devonian objectives.

Stony Plain.—A Vancouver independent, Midland Petroleums, Ltd., has chalked up a natural-gas discovery at its second Alberta wildcat. The strike was made in the Lower Cretaceous, and flow rate during one of the tests from 4,361-91 ft. gave a daily measurement of 3½ million cubic feet. The well was carried down in the Cretaceous to 4,421 ft. and test made to that depth from 4,400 ft.; the gas flow was 3 million cubic feet plus a pipe recovery of 300 ft. of salt water. Drilling is now proceeding ahead for Devonian objectives at 4,987 ft.

The well, 1 Midland-Texaco-McColl, is located in LSD 7, 11-53-1w5, in the Stony Plain area of central Alberta, about 11 miles northwest of Imperial's Golden Spike oil strike and about 15 miles northwest of Leduc-Woodbend oil field. It is on a farmout block from the McColl-Frontenac and Texaco Exploration team.

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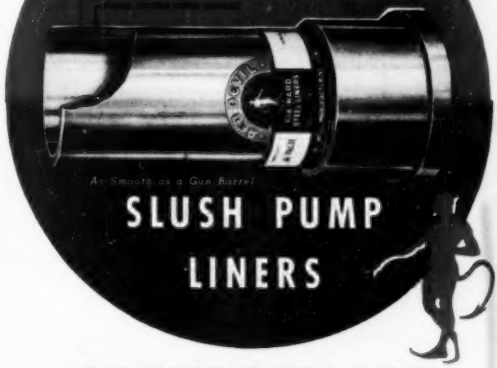

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1, recent Lower Cretaceous oil success about ¾ mile southwest of Imperial's Whitemud oil discovery, ran a test of potentialities during the last few days. Company officials report that the well made 40.5 bbl. hourly, an indicated daily rate of 972 bbl., with a gas-oil ratio of 325 cu. ft. per bbl. Gravity of oil tested at 38.2°-A.P.I. Length of test run and whether or not the oil was clean has not been specified.

The new Pacalta venture, located in LSD 9, 15-51-25w4, is a joint test among New Pacalta Oils, Ltd.; Chief Redwater Oils, Ltd.; Freehold Oil Corp., Ltd.; Granleduc Oils Ltd., and the George Richardson Trust.

Wildcat abandonments.—1 Imperial-Darling, LSD 16, 19-62-19w4, TD 6,603 ft.; 1 Texaco-McColl-Isle Lake, LSD 13, 30-54-5w5, TD 6,707 ft.; 2 Chief Redwater, LSD 8, 9-51-25w4, TD 4,322 ft.

EASTERN TEXAS

Wood County Gets Two Sub-Clarksville Discoveries

DALLAS.—Wood County had two small sub-Clarksville discoveries this week, one of which completed and the other was installing pumping equipment. The new completion was F. R. Jackson et al 1 Joe Carr, James Colsen Survey, 3¼ miles south of Golden. Perforations were in the top of the sand at 4,612-38 and 4,644-52 ft. Initial was 30.25 bbl. of 18°-gravity oil a day, on the pump.

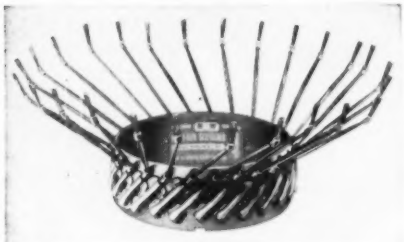
Two miles south of Alba, Shell Oil Co., Inc., 1 Consumers Lignite, McMahan Survey, was installing pump after swabbing perforations at 4,153-70 ft. Amount of fluid being recovered was not reported. Fluid level was steady around 1,000 ft. from the surface. Location is 2 miles south of the Alba sub-Clarksville field, but separated from the field by dry holes.

In Harrison County, Atlantic Refining Co. 1 M. P. Isom, 7 miles northwest of Hallsville, was drilling in sand and shale at 7,950 ft. A 1-hour drill-stem test at 7,804-50 ft. produced a light blow throughout the test and recovered the water blanket plus 60 ft. of gas-cut mud. Gas also broke out of the bottom 10 stands of water cushion. Bottom-hole flowing pressure was 725 psi. Shut-in pressure was 1,800 psi. There were no shows of distillate or water. At 7,844-7,900 ft., the recovery in 1 hour was 100 ft. of heavily gas-cut mud and 1,463 ft. of water cushion, from which gas started breaking out on the thirteenth stand. At 7,900-50 ft., using 1,495 ft. of water cushion, the recovery was 65 ft. of slightly gas-cut mud, plus the water cushion. Gas broke from the first stand of water and continued through each stand. Bottom-hole flowing pressure was 700 psi.

EAST TEXAS (DISTRICTS 5, 6 & 6-P) SUCCESSFUL WILDCATS

Franklin County: Byars & Peveto 1 Mark Talley, SPRR Sur., 8 mi. N Mt. Vernon, pumped 135 bbl. 24°-gravity oil a day, Paluxy sand 4,412-17 ft., TD 4,421 ft.

Kaufman County: R. W. Fair 1 Angus Wynne, B. S. Newman Sur., 3¾ mi. SW Cedarvale, flowed 230 bbl. 30°-grav. oil a day, 10/64-in. choke, Paluxy sand 4,965-83 ft., TD 4,987 ft., operators believe the well has water drive as there was very little gas produced.



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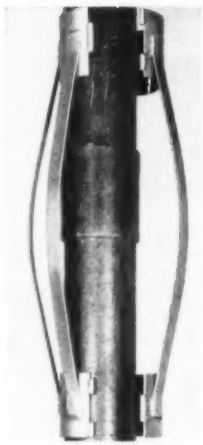

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CALIFORNIA

Seven Tests Under Way In Cuyama Valley

LOS ANGELES.—Recent attempts to extend production in the Cuyama Valley fields have not been very successful. However, new locations are being set up about as fast as extension tests are finished. There are now seven tests being made, far enough from production to be classed as wildcats. There are also 25 development wells being drilled.

To the north of Russell Ranch production two wells were abandoned. These are Richfield Oil Corp. 2 Harrington, at 2,265 ft., and Michael Kadlec 1 Kosanke, at 1,460 ft. This last well may be deepened later. Both wells are in Block 14-11n-28w.

There are four wells trying for westerly extensions to Russell Ranch field. Two of these, Crawford & Hiles 1 Cuyama, and Wood-Callahan 13A-25, are close in to present production. The 46-16 Gerald-Calloway, of W. R. Gerard, however, is about 4 miles west of production and Richfield's B-1 Homan location is now set about 3 miles southwest of production.

Nearly midway between Russell Ranch field and South Cuyama field, Richfield has located well 87-22. The location is 990 ft. north and 330 ft. west of SE corner, 22-10n-27w. This is about 1½ miles northwest of South Cuyama production and about 2 miles southeast of Russell Ranch production.

Bolsa Chica Oil Corp. has stepped up its activity in the extreme southeast end of the Cuyama Valley. Its 1 Hickey is now drilling below 5,700 ft. in 30-9n-24w. It has now leased an additional 712 acres 4 miles northeast of the Hickey well.

Carrizo Plains is showing the first signs of oil production in Temblor-Rexroth 67-36 of Gene Reid et al. The well now stands at 3,344 ft. awaiting heavier equipment. Oil shows have been reported. About ½ mile north of this well the same group has found shows in its Producers 53-36. Tight sand was found at 1,560 ft. and at last re-

ported depth, 1,730 ft., was still in the sand.

General Petroleum Corp.'s deep test at Lost Hills, Kern County, has encountered some difficulties but is now drilling ahead. Following recovery of fish the well was plugged at 1,772 ft. and is redrilling at 1,800 ft.

One of the very few cable rigs operating in California is drilling 4 Oceanside for Elmer C. Von Glahn in the Kreyenhagen Hills area of Fresno County. Streaks of oil sand were located at 115-80 ft. Drilling continues past 575 ft.

CALIFORNIA WILDCAT FAILURES

Kern County, Tejon Hills area: Stansbury Inc. and Crown Drilling Co. 52-31 Tejon Hills, 31-11n-18w, dry, top Santa Margarita 1,280 ft., TD 1,327 ft., elev. 838 ft.

Kings County, Fresno Slough area: Shell Oil Co., Inc., 1-1 Unit, 1-18s-19e, dry, TD 8,500 ft., elev. 228 ft.

Los Angeles County, Monterey Park area: Richfield Oil Corp. 1 Garvey Hills, dry, TD 3,860 ft., elev. 486 ft.

San Luis Obispo County, Cuyama Valley Richfield Oil Corp. 2 Harrington U. S., 14-11n-28w, dry, TD 2,265 ft., elev. 2,482 ft.

Carrizo Plains area: The Texas Co. 1 Grayson-Owen, 14-31s-18e, dry, TD 2,460 ft., elev. 2,073 ft.

LA.-ARK.

LaSalle Parish Wildcat Preparing to Perforate

SHREVEPORT.—H. L. Hunt 149-F Nebo Oil Co., LaSalle Parish wildcat in SW SW 35-7n-3e, had total depth at 4,036 ft., in the Wilcox, and prepared to perforate and test after recovering oil on a drill-stem test. Location is a north offset to Justiss-Mears Oil Co. 1 Harris, NW NW 2-6n-3e, which swabbed some oil from the Wilcox at 4,004-14 ft., and was last reported as installing pump.

Hunt's prospector cored oil sand from 4,011-17 ft., then drill-stem tested the interval, using ⅝-in. bottom and ¼-in. top chokes. The tester was open 22 minutes, which produced a maximum tubing pressure of 40 psi. and recovered 770 ft. of 43.8°-gravity oil, plus 13 ft. of oil-cut mud. Location was made by Hunt for the 150-F Nebo, in NE NE 3-6n-3e, as a west offset to the 1 Harris.

Bossier Parish.—Root Petroleum Co. staked another core test location and was rigging up rotary for a 3,500-ft. test. It is the 3 Crystal Oil & Refining Co., NE NE SE 4-19n-12w. The numbers 1 and 2 Crystal Oil were: NE NE NE 7-19n-12w, and NE NE SE 9-19n-12w. Drilling depths on the latter two were not disclosed.

Caldwell Parish.—Sohio Petroleum Co. 1-C LaSalle Land Co., SE NW 27-13n-5e, cored sand and shale with no shows at 6,108-32 ft., and was drilling ahead below 6,272 ft. It was in the Tuscaloosa, topped at 5,580 ft.

Claiborne Parish.—Hunt Oil Co. 1 J. H. Owens, 19-23n-6w, was drilling in the Smackover at 12,053 ft. Details were not reported, other than a sample top on the Smackover at 11,300 ft., on elevation of 280 ft.

In Arkansas, exploration work continued at a low level. Quad Drilling Co. 1 Crossett Lumber Co., Drew County wildcat in 23-13s-6w, resumed operations and was drilling below 400 ft. It was shut down for 2 weeks by high water, after setting surface casing.

In Ouachita County, McAlester Fuel Co. 1-A Berg, NW NW NW 17-15s-18w, was in the Glen Rose at 2,917 ft. Peterson Drilling Co. 3 Dean, 16-14s-19w, had a show of oil in the Nacatoch, and prepared to install pump. Total depth was 1,292 ft.

H. B. Brown 1 Hudson, 17-19s-13w, Union County, was coring the Cretaceous at 3,140 ft. Contract depth was 3,500 ft. Lion Oil Co. 1 Loftin, 34-18s-18w, was drilling in the Cotton Valley at 6,919 ft., topped at 6,070 ft. Walter Lown 1 Baker, 22-16s-14w, was drilling below 3,110 ft., in the upper Cretaceous. Don D. Montgomery 1 J. K. Mahoney, 25-17s-18w, was below 6,001 ft., still in the Travis Peak.

NORTH LOUISIANA WILDCAT FAILURE

Franklin Parish: M. H. Dees and J. E. Slack, Jr., 1 S. D. Ballard, SE SW SE 9°-12n-7e, dry, TD 698 ft. in Sparta sand, no shows.

ARKANSAS SUCCESSFUL WILDCAT

Columbia County: McAlester Fuel Co. 1-A T. O. Giles, NW NE 6-18s-18w, flowed 78 bbl. 45°-grav. oil a day, plus 5 bbl. salt water, 11/64-in. choke, Smackover top 7,726 ft., perf. 7,766-71 ft., TD 7,876 ft., PB 7,778 ft., elev. 210 ft.

ARKANSAS WILDCAT FAILURE

Cleveland County: Hyman Ginsberg 1 C. B. Atwood, SE SW SE 2-11s-11w, dry, TD 3,714 ft., Arkadelphia 2,729 ft., Nacatoch 2,930 ft., Saratoga 3,123 ft., Meakin sand 3,150-75 ft., carried water, Meakin top by samples.

SOUTH LOUISIANA

New Oil Pay Found On Weeks Island Dome

NEW ORLEANS.—A new rich oil pay has been opened on the southeast flank of the Weeks Island Dome, Iberia Parish, in 44-14s-7E, by Humble Oil & Refining Co. B-5 Burguires Co., Ltd. The hole was drilled to 7,547 ft., and 9⅝-in. casing cemented to 6,593 ft. String was perforated in the new sand at 5,775-80 ft., and the well flowed 227 bbl. of 25.5°-gravity oil per day through 3/16-in. choke with flowing pressure on the tubing of 390 psi.

Atlantic Refining Co. 1 Stokes Unit, a deep exploration in Dave Haas field, Avoyelles Parish, failed to pay off in the deep sands and had to be completed in the regular Wilcox pay sands at 8,500 ft. The deep-

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est in the field, the well was drilled to 11,200 ft., and tests at 9,722-42 ft., and 9,092-9,142 ft. failed to show any commercial production. Completion was made through perforations at 8,510-40 ft., and the well flowed 120 bbl. of pipe-line oil per day through 10/64-in. choke, with 1,100-psi. tubing pressure.

Kerr-McGee Oil Industries, Inc., 1 State Lease-Block 33, wildcat approximately 3 miles off shore from Cameron Parish, has been drilled to 13,282 ft. and operators are preparing to test. Drill pipe was hung at 9,325 ft., and the hole was cleaned out and the pipe is cemented near the total depth for the tests.

Operators are preparing to test Continental Oil Co. 1 R. A. Estes, wildcat, approximately 1½ miles northeast of the Welch Dome, Jeff Davis Parish, 11-9s-5w. A string of 4-in. liner has been cemented at total depth of the well, 11,474 ft., and is ready to commence testing. Several kicks have been encountered by the operator while drilling below the protection string, which was cemented to 8,890 ft.

SOUTH LOUISIANA SUCCESSFUL WILDCATS

Iberia Parish: New pay, at Weeks Island—Shell Oil Co., Inc., 2 Smith-State Unit "C," 18-14s-7e, top sand 13,728 ft., TD 13,839 ft., perf. 13,728-43 ft., IP: 378 bbl. oil per day through 9/64-in. ch., GOR 10,112, TP 2,550 psi., 34°-grav.

Terrebonne Parish: New pay, at Caillou Island—Texas Co. 1 State lease 301-Woods Unit 1, 25-23s-19e, top sand 9,990 ft., TD 12,417 ft., perf. 9,990-10,008 ft., IP: 238 bbl. oil per day through 11/64-in. choke, GOR 8,250, TP 4,975 psi., grav. 46.2°.

SOUTH LOUISIANA WILDCAT FAILURES

Acadia Parish: P. W. Ward Co. 1 John Wilfert, 1 mile south of Bayou Mallet, 14-7s-1e, dry, TD 4,036 ft.

Lafourche Parish: J. R. Frankel Co. 2 Clotilda Plantation, in 12-16s-19e, dry, TD 12,905 ft.

Placid Oil Co. 1 City of New Orleans, in 22-23s-22e, 2 mi. west of Bay Marchand prospect, dry, TD 14,767 ft.

St. Bernard Parish: Woods Drilling Co. 1 Vincent-Hayne, 14-12s-13e, 12 mi. east of New Orleans, dry, TD 9,529 ft.

Use

Fig. 179 Acme W. L. Knife Cutters

Fig. 188 Cover Plate

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TEXAS GULF COAST

New Oil Sand on East Flank of Nash Dome

HOUSTON—A new oil sand in the Miocene section has been discovered on the east flank of the Nash Dome, Fort Bend County, with the completion of Henshaw Brothers-King & Heyne 2 Fiessner, in the Thomas Alsberry Survey. Completion was made from open hole, from 3,978 ft. to 4,005 ft., and the well flowed 172 bbl. of 19°-gravity oil per day through ¼-in. choke. This is the second oil producer for the pool. The other producer is from the Frio sand on the north flank of the dome.

A new gas-condensate pool has been opened by Rowan Oil Co. and Texas Gulf Producing Co. 1 J. H. Blackwell, deep wildcat, 2 miles northwest of Algoa, Galveston County. The well gaged 1,182 M.c.f. of gas per day plus 9 bbl. of 38°-gravity oil through ¼-in. choke from the lower Frio at 10,554-61 ft.

A new field is indicated by the Humble Oil & Refining Co. 1 Liverpool Gas Unit, wildcat, in the Liverpool area, Brazoria County. On drill-stem test the well recovered 1,350 ft. of oil from 9,985-95 ft. Total depth of the well is 11,826 ft., with 7-in. casing set at 11,524 ft.

McCarthy Oil & Gas Corp. 1 W. H. Ector, wildcat, southeast of the Blue Ridge Dome, Fort Bend County, is by far the deepest test in that county. Total depth of the well is 13,528 ft., and operators are said to be laying down drill pipe; however, no details have been released. The well is located in the Thomas W. Thompson Survey, 1,500 ft. northeast of 1 Rabb, which was drilled to 10,507 ft., and abandoned after encountering a strong hot-water flow.

Gas-condensate sands have been cored at 6,300 ft. in the H. A. Potter 4 Henry T. Freeman, a west outpost to Sargent field, Matagorda County. Several sections are reported to be productive for the gas-condensate flow, and operator plans to drill ahead to approximately 6,450 ft. and commence coring again for the 6,500-ft. sands.

TEXAS GULF COAST (DISTRICTS 2 & 3) SUCCESSFUL WILDCATS

Ft. Bend County: New pay, at Nash—Henshaw Bros.-King & Heyne 2 D. Fiessner, in T. Alsberry Lge., top sand 3,978 ft. (Miocene), perf. open hole 3,978-4,005 ft., TD 4,005 ft., IP: 172 bbl. oil per day, ¼-in. choke, TP 210 psi., CP 475 psi., 19° grav.

Live Oak County: New pay, at Clayton-Outpost—Western Natural Gas Co. 1 C. S. Herring et al, in D. R. Fant Sur. 248, 4 miles south of Simmons City, top sand 6,490 ft. (Slick sand), TD 7,020 ft., perf. 6,490-99 ft., IP: 60,000 M.c.f. gas per day on open flow, SIP 2,420 psi., GOR 73,000, 50.7° grav.

Tyler County: New pay, at E. Hillister—Humble Oil & Refining Co. 3 Wm. Rice Institute, in A. Hutchins Sur. A-846, top sand 4,946 ft., TD 4,961 ft., perf. 4,946-49 ft., IP: 81 bbl. oil per day, ¼-in. choke, GOR 8,345, TP 1,650 psi., CP 1,950 psi., 37.6° grav.

TEXAS GULF COAST (DISTRICTS 2 & 3) WILDCAT FAILURES

Chambers County: H. B. Hebert 1 D. G. H. Fahring, H&TC Sur. 77, A-129; 5 miles southeast of Anahuac, dry, TD 9,207 ft.

Live Oak County: Humphries & Hotchkin

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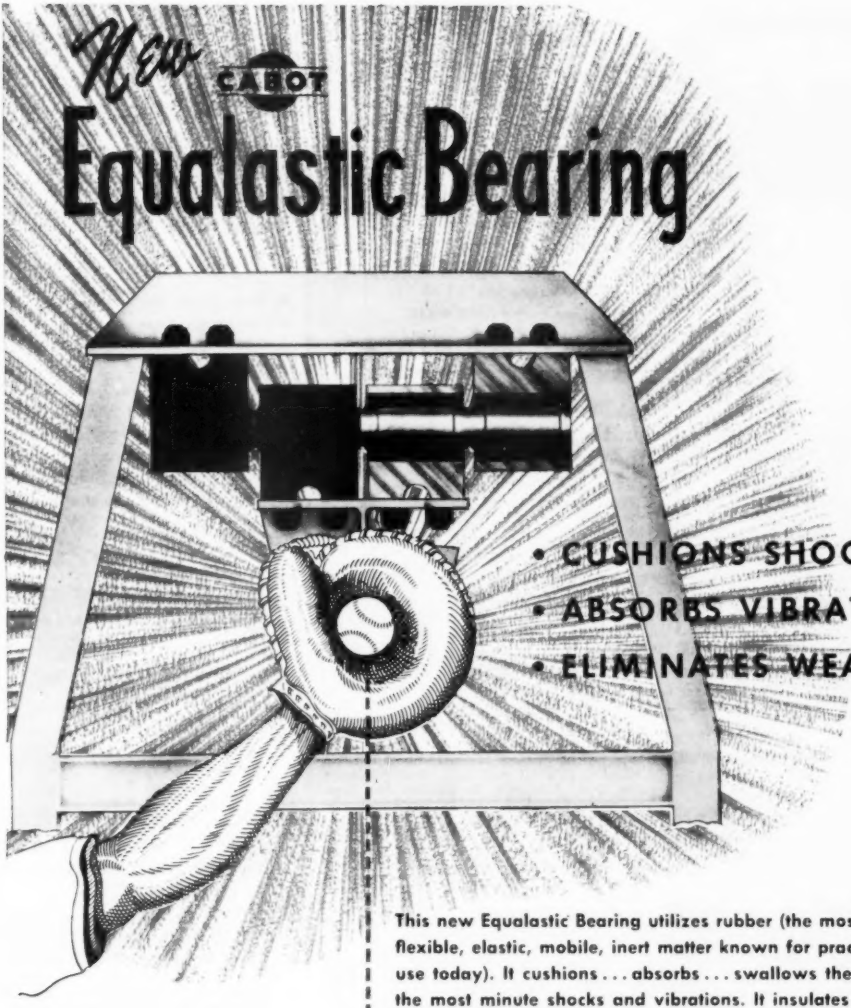

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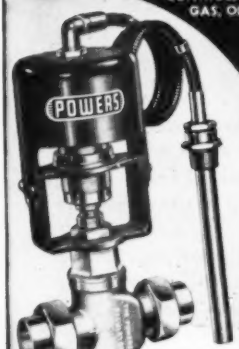

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WRITE FOR BULLETIN 329P

POWERS

1 Alamo Lumber Co., in Festus Doyle Sur., ¾ miles north of Sunland, dry, TD 1,498 ft.

W. R. Quin 1 E. W. McWhorter, in G&BN Sur. 2, 7 miles southeast of George West, dry, TD 4,188 ft.

Orange County: Sun Oil Co. 3 Brown Est., in Orange-Hackberry area, Bradley Garner Sur., dry, TD 6,614 ft.

Refugio County: P. R. Rutherford 1 Mrs. Julia E. Shay, in Thomas Scott Sur., 5 miles north of Refugio, dry, TD 7,512 ft.

Tyler County: C. N. Housh 1 J. B. Reid et al, in No. Skillern area, BBB&C Sur., dry, TD 7,814 ft.

Waller County The Chicago Corp. & Michel Halbouty 1 Hooks & Farrington, 3 miles southwest of Pattison townsite, dry, TD 8,431 ft.

ROCKY MOUNTAIN

Tide Water Deepening Test In Grand County, Utah

DENVER.—Tests in the Mississippian (?) at Tide Water Associated Oil Co. 74-11, NW NW NW 11-26s-19e, on the Big Flat unit, Grand County, Utah, showed a small amount of gas, with a small amount of oil, and the operator is now drilling the well deeper. A core between 7,905-15 ft. showed fractured lime, with shows of oil in fractures. Three drill-stem tests of the zone failed and on the fourth, between 7,829-7,738 ft., the well made 350 ft. of gas-cut mud with strong odor in 1 hour. The well is now below 7,955 ft., in soft, crystalline limestone, with some salt in fractures. This wildcat is of importance as the first below the Paradox salt section in this area of Utah. Shows were also encountered in the upper Paradox and Hermosa formations, and heavily oil-cut mud was recovered on tests. The prospect is located on a surface and seismic prospect on the southwestern side of the Salt Basin. Leasing has been extensive throughout the area, with Sinclair Oil & Gas Co., General Petroleum Corp., and others holding blocks through the area.

General Petroleum has cemented casing on its wildcat at 37-X-24-G, NW SE SW 24-47n-92w, in the South Frisby area, Washakie County, Wyoming, after finding shows of oil in the Phosphoria. The well was drilled to 10,665 ft., total depth, and shows were found in cores below 10,560 ft. Phosphoria was topped at approximately 10,575 ft. This unit is located southeast of Worland field, where Pure Oil Co., Carter Oil Co., Trigood Oil Co., and Sharples Oil Corp. have production in the Phosphoria. General Petroleum has seismographed this unit, which is north of the company's South Fork field, where Phosphoria production is found below 10,000 ft.

The first drilling following an extensive lease play throughout the Williston Basin of North Dakota was announced this week with location by Continental Oil Co. and Pure on their 1½-million-acre spread throughout Burleigh, southern Sheridan, and northern Emmons counties. The well will be a stratigraphic test, possibly to granite, in the southwest corner of 6-140n-77w, 20 miles northeast of the town of Bismarck. The rig is Continental's slim-hole strat rig from Texas and the operators are now moving in equipment.

WILDCAT FAILURES IN WYOMING

Smith Fork, Lincoln County: Shell Oil Co., Inc., 1 Unit, NE SW NE 16-30n-118w, 7,630 TD, plugged and abandoned. Twin Creek 460, Nugget 890, Ankareh 1,320, Thaynes 1,750, Woodside 2,780, Phosphoria 4,940, Wells 5,180, Amsden 6,400 ft. (?).

Clear Creek, Sheridan County, Shell Oil Co., Inc., 1 Clear Creek, C NW SE 11-57n-78w, 12,215 TD, plugged and abandoned, Pierre 4,635, Eagle 5,275, Muddy

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8,552, Cloverly 8,884 (?), Sundance 9,103, Minnelusa 10,170 (?), Mississippian 10,644, Cambrian 11,970 ft.

WILDCAT SUCCESS IN MONTANA

Jack Creek area, Carbon County—Shupak 1 Parker, SW SW SE 13-7s-23e, 510 TD, pumped 125 bbl. fluid per day 20 per cent oil, 39.8° gravity oil. Dakota 506.

WILDCAT FAILURE IN MONTANA

Seven Mile, Carter County—L. W. Roche 1 Morgan, SW NE NE 7-9s-61e, 1,495 TD, standing.

NEBRASKA WILDCAT FAILURE

Dawes County: Hollingsworth 1 Tobin, NE NE SW 25-35n-48w, dry, TD 2,670 ft., Niobrara 370 ft., Carlile 560 ft., Greenhorn 940 ft., Graneros 908 ft., Dakota 2,005 ft., Fuson 2,090 ft., Lakota 2,140 ft., conglomerate 2,250 ft., Morrison 2,270 ft., sand 2,280 ft., Sundance 2,430 ft., sand 2,460 ft., basal Sundance 2,515 ft.

KANSAS

Kansas Exploration Yields Four Additional New Pools

FOUR additional wildcat tests, two in Ellis County and one each in Cowley and Stafford counties, are testing or giving indications of opening new pools.

In the northeastern part of Ellis County, J. M. Huber and associates 1 Chrisler, NW NW SW 22-11-16, 2 miles east of the Bemis-Shutts pool, swabbed 12 to 14 bbl. of oil per hour for 3 hours while testing the Lansing-Kansas City, in which casing was perforated at 3,100-12 ft. Lansing was topped at 3,060 ft. (—1,212 ft.).

M. B. Armer 1 Dreiling, SE SE NE 21-14-16, 6 miles southeast of the Herzog pool, in the southeastern part of the county, swabbed at the rate of 5 bbl. per hour from the Arbuckle after acidizing with 5,000 gal. Total depth is 3,388 ft. with 5-in. casing at 3,377 ft. Arbuckle was topped at 3,366 ft. (—1,502 ft.).

In Cowley County, G. T. Lackey 1 Manser, NW NW SE 25-31-6e, 4½ miles east of the Burden pool, filled up 400 ft. with oil when drilled to 2,182 ft. in Layton sand, topped at 2,170 ft. (—784 ft.). Casing has been run to the top of the pay for completion. Location has been made for 1 Foster, a north offset.

Musgrove Petroleum Corp. 1 Hart, SW SW NE 36-22-14, western Stafford County, is preparing to test showings encountered in the Arbuckle, topped at 3,826 ft. (—1,900 ft.) and drilled to 3,832 ft. Casing has been run to 3,830 ft. The well also had some saturation in the Lansing, topped at 3,462 ft. In a drill-stem test of this zone at 3,578-91 ft., 30 ft. of slightly oil-cut mud was recovered. The discovery is 3 miles southeast of the Nellie pool and about 4½ miles south of the Curtis pool.

The Northwest Catherine pool in Ellis County is being extended ¾ mile southwest by W. L. Hartman and Jack Hinkle 1 Reed, NW NE SE 5-13-17, which swabbed 8 bbl. per hour in tests of the Arbuckle at 3,595-3,621 ft. (—1,546-72 ft.).

A half mile south of the Southwest Zyba pool, Sumner County, Petroleum, Inc., and associates 1 Hurst, NW NW SE 22-30-1w, flowed at the rate of 25 bbl. per hour in completion tests in Simpson sand at 3,920-33 ft. Top of sand is 3,918 ft. (—2,636 ft.).

KANSAS SUCCESSFUL WILDCATS

Barton County: Bay Petroleum Co. 1 Krone, SW SW SW 30-20s-12w, 30 bbl. of oil per day from Arbuckle at 3,492-3,531 ft., TD.

Rice County: Henderson Oil Co. 1 Proffitt, SW SW NW 13-20s-10w, 62 bbl. of oil per day from Arbuckle at 3,340-45 ft., TD.

KANSAS WILDCAT FAILURES

Butler County: Elreco & Cox & Burns 1 Wait, SW SW NW 21-26s-4e, dry, TD 2,612 ft.

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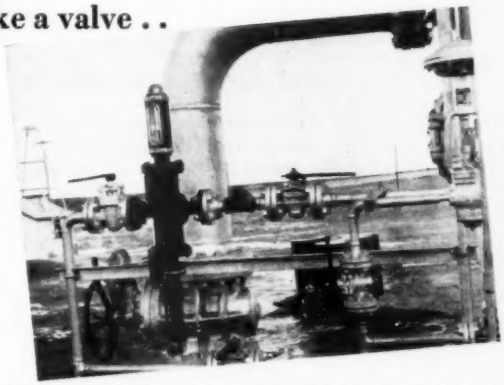

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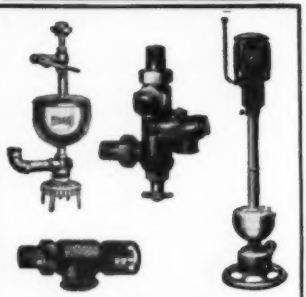

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Ellis County: Ben Brack 1 Pfannenestiel, SE SE NW 24-14s-19w, dry, TD 3,840 ft.
Harper County: Gillespie & Sons et al 1 Prouse, SE SE SE 6-34s-5w, dry, TD 5,183 ft.
Lyon County: George Johnston et al 1 Casey, NE NE SW 31-15s-10e, dry, TD 3,293 ft.
Osborne County: Bennett & Roberts and Wilcox 1 Seefeld, NW NW SW 32-10s-15w, dry, TD 3,950 ft.
Rice County: Derby Drilling Co. 1 Boldt, NW NW NW 19-18s-9w, dry, TD 3,313 ft.
Sedgwick County: Carlock et al 1 Thrift, NE NE NE 29-29s-3w, dry, TD 3,325 ft.
Stafford County: Hinkle Oil Co. 1 Copeland, NE NE NE 30-24s-13w, dry, TD 4,201 ft.

MICHIGAN

Test Shows Promise of New Traverse Field

MOUNT PLEASANT.—Showing ½ bbl. of oil an hour natural from the Traverse, Basin Oil Co. 1 Martinia, SW SW NW 36-7n-15w, Robinson Township, Ottawa County, held promise of opening a new Traverse field in southwestern Michigan. Traverse lime was logged at 1,641 ft. and hole was bottomed out for test at 1,654 ft.

Best oil show was logged between 1,650-54 ft. but another show accompanied with water was logged above this point between 1,645-50 ft. which showed four bailers of salt water and one-half bailer of oil overnight. Casing was run and cemented at 1,641 ft. and wildcat was scheduled to be acidized this weekend.

The Basin wildcat showed structure and was higher on the Traverse lime top than other close-in tests which also carried Traverse shows. Well was drilled on a 1,200-acre block. Ford Oil Co. is associated with Basin in this test.

Interest in the new Paris Traverse development area, Green Township, Mecosta County, was focused on two offsets to John A. Thompson's 1 Cox discovery producer. To the southwest Cities Service Oil Co. 1 Brennan, SE NE NW 26-16n-10w, showed 476,160 cu. ft. of Stray gas on drill-stem test, and to the northeast Rex Oil & Gas Co. 1 Cox, SE SW SE 21-16n-10w, was being rotary drilled below 2,400 ft. with plans set to core the Traverse within 3 days. The Cities Service test was reported to be 8 ft. lower than the discovery on the Stray sand, while the Rex offset was 10 ft. higher on this same marker. Both may be carried to the Dundee-Reed City zones before final completion, even if commercial production is encountered in the Traverse.

MICHIGAN WILDCAT FAILURES

Arenac County, Lincoln Township: Roush, Rayburn & Whyte 1 Twarog, SW NE NE 14-18n-4e, Dundee 2,685 ft., dry, TD 2,890 ft.
St. Clair County, Wales Township: Shiawassee Deep Drilling Co. 1 Hardeman, NW NW SW 24-6n-15e, Dundee 1,027 ft., dry, TD 1,101 ft.

MISSISSIPPI

Lincoln County Gets Third Pool for Year

JACKSON.—Big Chief Drilling Co.-W. B. Osborn 1 George Ziegler, wildcat in Lincoln County, Mississippi, has been completed a producer. Drilled to a total depth of 10,660 ft., perforations were made at 10,553-10,559-61 ft., and on drill-stem test the well flowed 225 bbl. of 37°-gravity oil per day through ⅜-in. choke on bottom and 3 16-in. choke on top, with pressure on the tubing at 410 psi. This is the third pool for Lincoln County and the fourth new strike in the state this year.

Stanolind Oil & Gas Co. 1 J. B. Dockery, irregular 17-10n-2e, Jefferson County, Mississippi, continues to be of interest. On second drill-stem test packer was set at 9,730 ft., tool was opened and the well was flowed 1 hour and 45 minutes with pressure steadily building up to 775 psi. and stabilized shortly before the tool was closed. Estimated flow was 17 bbl. of oil per hour. Total depth of the well is 9,952 ft. Operators plan to perforate two other sand stringers, 9,737-43 and 9,724-32 ft., and then take a drill-stem test on all three sands.

It is reported that George Vasen is preparing to resume drilling on his 1 Fee Well, in 9-2s-11w, Stone County, Mississippi, which has been drilled to a total depth of 14,204 ft., with 7-in. casing cemented at

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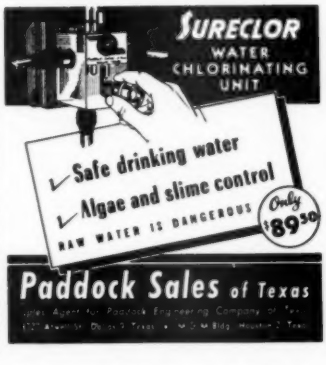

Paddock Sales of Texas

14,038 ft. He plans to drill to 16,000 ft., or the Smackover lime.

Humble Oil & Refining Co. is preparing to set surface casing at its wildcat test, 1 Masonite-GM&O, 29-7n-7w, in Wayne County, Mississippi. Proposed depth of the well is 11,600 ft., and it will be closely watched for developments.

ALABAMA WILDCAT FAILURE

Clarke County: Humble Oil & Refining Co. 1 Bixler, 27-7n-3e, dry, TD 6,070 ft.

MISSISSIPPI WILDCAT FAILURE

Adams County: C. W. Sharp 1 Mrs. J. M. McDowell et al, 2-6n-3w, dry, TD 6,624 ft.

ILLINOIS

White County Test Proves Discovery of New Oil Pool

MATTOON.—Discovery of a new producing area north of the New Haven pool and west of the Prairie pool in White County is being established by swabbing tests in C. E. Skiles 1 McCallister, NW SW NE 7-7s-11e. Taking in two zones, the Tar Springs at 2,150-58 ft. and the Cypress at 2,480-88 ft., the well produced at the rate of 3 bbl. of clean oil per hour. Indications are it will make a good pumper.

Miracle-Steber 1 Stella Jack, SW SW NW 7-in-11e, Edwards County, another prospective new pool opener, swabbed 20 bbl. of oil and 100 bbl. of water on a 12-hour production test of McClosky lime at 3,232-47 ft. Total depth is 3,280 ft. It is 1 mile southeast of production in the East Maple Grove pool.

Several other new pools have been definitely established by completions during the week. The Texas Co. 1 Frank-Meyer Unit, NE SW SE 3-1n-1e, 4 miles north of Centralia in the area between the Salem and old Brown pools, has been finalled on the pump for 220 bbl. daily. Production is from the Rosiclare at 1,924-34 ft. and the McClosky at 1,950-58 ft.

C. E. Skiles 1 Abell, NW SE SW 14-8s-9e, Gallatin County, made 112 bbl. per day on the pump from Cypress sand at 2,510-17 ft. It is near the center of the triangular area formed by the Inman, North Inman and West Inman pools. Illinois Mid-Continent Co. and Aurora Gasoline Co. 1 Richardson, NW NE SW 9-1n-5e, 2 miles north of Orchardville, Wayne County, and 3 miles from other production, gaged 669 bbl. per day, natural flow, on completion. Hoiles Petroleum Co. 1 Hoiles, SW SW SW 13-4n-3w, 5 miles northwest of the Beaver Creek pool, Bond County, has been completed on the pump for 7 bbl. per day from the Benoist sand at 1,119-24 ft. In the meantime, the same operator has completed his first confirmation well, his 1 Smith, a southeast offset to the discovery well, in the same pay at 1,114-24 ft.

ILLINOIS WILDCAT FAILURES

Brown County: Crandall & Hurst Oil Trust 1 W. J. Thomas, NE SW NW 15-1s-2w, dry, TD 612 ft.

Champaign County: Van Tarble 1 Kirby, SE SW SW 20-20n-10e, dry, TD 352 ft.

Clark County: C. A. Ritchie 1 Turner, NE SW SW 14-11n-14w, dry, TD 525 ft. F. A. Bridge 1 J. R. Kelly, NW SE NW 29-11n-13w, dry, TD 500 ft.

Clinton County: Ash Drilling Co. 1 List, NE SE NW 16-1n-3w, dry, TD 1,292 ft. E. A. Obering 2 Bond Est., NW SW NW 7-2n-2w, dry, TD 1,168 ft.

Edwards County: C. E. Skiles 1 Haims, SW SW NW 5-1s-14w, dry, TD 3,218 ft.

Gallatin County: C. T. Smith 1 Hale, SE SE NE 21-7s-9e, dry, TD 3,109 ft.

Randolph County: Klebleker-Schnetzmeyer 1-A McMiller, NE NE SE 7-5s-5w, dry, 120 ft.

Shelby County: Tuley & Carter 1 W. A. Ruble, SE NE SW 6-13n-2e, dry, TD 1,393 ft.

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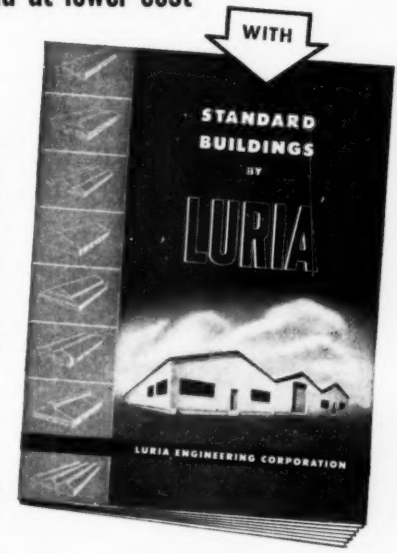

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PERMIAN BASIN

Mitchell County Discovery Shut In for Storage

MIDLAND. — Superior Oil Co. 1 J. R. Dockery, northwestern Mitchell County Ellenburger discovery, was shut in for additional storage after filling a 500-bbl. tank at the rate of 20-25 bbl. an hour. Some reports credited the well with making 60 bbl. of oil in 1 hour. There was no formation water with the 45°-gravity oil.

Open hole from 7,981-8,024 ft., total depth, had been treated with 2,000 gal. of acid. The well kicked off after swabbing. Top on the Ellenburger had not been confirmed other than the tentative figure of 7,968-90 ft., reported last week. Elevation was 2,165 ft. Location is in the NE NE 17-28-T1S-T&P, southwest of the town of Westbrook.

Scurry County.—The North Snyder field gained an outpost location to the north, and another location closing the gap between the north and south producing areas. On the north, Stanolind Oil & Gas Co. 1 J. G. Whatley was staked in the SE SW 548-97-H&TC. It is 3¼ miles north and about 2 miles west of the main field, on acreage obtained from Imperial Agency Corp.

Tide Water Oil Co. located its 2 R. H. House, between the two fields, in 384-97-H&TC. It is 467 ft. from south and 1,867 ft. from west lines of the section.

Standard Oil Co. of Texas 2-7 Brown, NW SE 439-97, had top of the reef lime at 3,920 ft., subsea, which was said to be 21 ft. high to an east offset producer. It was drilling ahead below 6,590 ft. in lime.

The Pure Oil Co. 1 Whatley, approximately NE SE 394-97, had top of the reef at minus 3,945 ft., said to be slightly lower than wells to the north. It was drilling ahead at 6,485 ft.

On the east side of Sharon Ridge Canyon field, Lion Oil Co. 1 Marchbanks, SE SE 164-97-H&TC, completed for a daily potential of 487 bbl. of 44.6°-gravity oil, with no water, flowing natural through 16/64-in. choke from perforations at 6,550-90 ft. and 6,610-66 ft. Total depth was 6,693 ft.

Superior and Intex Oil Co. have filed application to the Railroad Commission for permit to deepen the 1 R. H. Jordan, 579-97-H&TC, to 9,200 ft., or to the pre-Cambrian. The wildcat was last reported drilling below 8,885 ft. in Ellenburger dolomite. Meanwhile, no decision had been handed down by the district court at Snyder on the suit filed by Stanolind for possession of the acreage on which the well is located.

Gaines County.—Ralph Lowe 1 Shell-Helen Cunningham, SE NW 4-A24-PSL, Canyon limestone discovery ½ mile west of the north end of Doss Clear Fork field, flowed 704 bbl. of 47°-gravity oil in 24 hours on completion test. The flow was gaged through ¾-in. choke, from perforations at 8,850-8,950 ft. The pay section had been acidized with 500 gal.

The Texas Co. staked location for a 7,500-ft. rotary wildcat 3 miles east of Ralph Lowe's 1 Cunningham. The new operation is to be the 1 E. D. Harris, NE NE 17-A-22-PSL. It is 2½ miles southeast of Robertson field.

Coke County.—Humble Oil & Refining Co. 1 J. L. Brunson, Section 311, Nicholas Eastland Survey, 1½ miles south and slightly east of Bronte field, swabbed 2-2½ bbl. of oil an hour for 6 hours, from the Palo Pinto at 4,375-96 ft. It was shut in for pumping equipment.

Andrews County.—Magnolia Petroleum Co. 18-B Cowden, 14-A55-PSL, southeast of Dollar Hide field, which has established Fusselman pay from 11,000-28 and 11,056-82 ft., was testing the Devonian. After swabbing perforations from 10,186-10,210 ft., the well kicked off and flowed 54 bbl. of 39°-gravity oil in 10 hours, through 26/64-in. choke. Gas-oil ratio was 1,667 cu. ft.

Upton County.—On the south side of Benedum field, Warren Wright and L. T. Lohman 1 C. W. Chancellor, NE SE Section 5, A. W. Daugherty Survey, has extended Silurian production 2 miles south, and Ellenburger production approximately ¾ mile southwest. Operators have filed application with the Texas Railroad Commission for permit to dually complete the well from both zones.

Republic Natural Gas Co. 1-D Rosa Halff Barnett, Section 39, Block Y, TC Survey, was also scheduled for dual completion from the Fusselman and Ellenburger pays.

WEST TEXAS (DISTRICTS 8 & 7-C) SUCCESSFUL WILDCATS

Runnels County: Humble Oil & Refining Co. 1 Sally Odom, 785 ft. from NE and 660 ft. from SE lines, Felix Sosa Sur. 302, 6 mi. SE Blackwell, flowed 319 bbl. 42°-gravity oil a day, 8/64-in. choke, lower Strawn 5,435-54 ft., GOR 1,150 cu. ft., TP 600 psi., top Strawn 4,762 ft., elev. 2,041 ft.

Mabee Drilling Co. 1 Mrs. Malinda Jameson, SE SE A. G. Wells Sur. 210, 3 mi. NW Talpa, flowed 2,500,000 cu. ft. of gas a day, pay 3,467-87 ft., TD 4,165 ft., SIP 1,050 psi.

WEST TEXAS (DISTRICTS 8 & 7-C) WILDCAT FAILURES

Coke County: T. W. Murray 1 L. T. Youngblood, Sec. 3, C&M Sur., Bronte townsite location, dry, TP 5,210 ft., Palo Pinto 4,390 ft., Strawn 4,675 ft., Bend 5,165 ft., Gardner 5,206 ft., elev. 1,814 ft., DST 5,166-86 ft., open 1 hr., gas to surface in 40 minutes, recovered 300 ft. gas-cut mud and 4,600 ft. of salt water.

Crane County: F. A. Callery, Harry Hurt et al 1 J. M. Moseley, 18-6-H&TC, 13 mi. E Abel field, dry, TD 5,710 ft., Yates 1,030 ft., San Andres 2,050 ft., Simpson 5,140 ft., Ellenburger 5,585 ft., elev. 2,333 ft.

Crockett County: Hassie Hunt Trustee 1-L University, NE SE 10-29-University Lands, 5½ mi. NE Fort Lancaster, 1 mi. NW production, dry, TD 8,626 ft., Ellenburger 7,965 ft., elev. 2,356 ft.

Irion County: Higgins & Cowan 1 Murphy,

(Continued on page 150)

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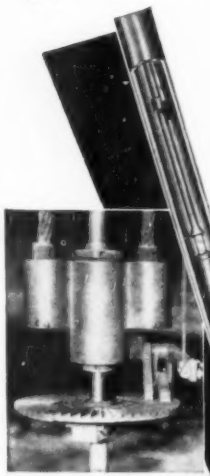

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OHIO, KENTUCKY

Offset Test Logs Second Berea at 1,002-21 Ft.

COLUMBUS.—Nollem Oil & Gas Co. 1 Harold Glazer, Lot 34, Washington Township, Tuscarawas County, the first offset to the discovery well, 1 Hunt, logged the Second Berea at 1,002-21 ft. with an open flow of 1,070,000 cu. ft. natural. A further test of the Oriskany horizon will probably not be made until a dry hole in the Berea is found.

Preston Oil Co. 1 Daniels-Ridenhour, Section 17, Hopewell Township, Perry County, an east offset to the 1 Henderson, drilled in with a good showing of oil in the Clinton at 2,777-2,802 ft. and made 78 bbl. in 24 hours after shot. In the south part of the township, in Baker pool, the Preston Oil 5 Baker, Section 34, had a hole full of oil natural and made 100 bbl. in 24 hours after shot. Clinton sand was found at 2,897-2,940 ft. Mid-East 5 Underwood, Section 34, showed 8 bbl. natural and 105 bbl. after shot from Clinton at 2,951-86 ft.

Oxford Oil Co. 3 Rambo, Section 26, York Township, Morgan County, gaged 260,000 cu. ft. in the Medina at 3,950-55 ft. and 500,000 cu. ft. 4 hours after shot. Oil from the Clinton was rated at 12 bbl. per day. Corrected report.

L. F. McGrath et al 4 Hausheer, Lot 42, Parma Township, Cuyahoga County, gaged 33,000 cu. ft. in the shell at 2,997-3,010 ft. and 984,000 cu. ft. in the red Clinton at 3,055-93 ft. The well will be tubed natural.

WILDCAT FAILURES COMPLETED IN OHIO

Ashland County, Ruggles Township: E. A. Fierbaugh et al 1 John Duta, Lot 3, Clinton 2,106-13 ft., TD 2,220 ft.

Knox County, Clay Township: Shuff & Bucy 1 Elliott, Lot 7, Clinton 2,718-47 ft., TD 2,788 ft.

EASTERN KENTUCKY

ASHLAND.—In western Powell County, 8-P-67, Arch Carpenter et al are drilling below 5,700 ft. on 1 James Hall, a seismic prospect for the area. The test is now reported to have passed through the Knox dolomite on its way to test possible Cambrian sands.

In Menifee County, George O. McNabb et al apparently have a dry hole at 1 Henry C. Smallwood on Black Stand Creek of Indian Creek. Topping Corniferous lime at 1,068 ft., the test penetrated 44 ft. of that formation to a total depth of 1,112 ft. Only a slight show of oil was had at 1,077 ft., followed by salt water at 1,081 ft. The well is currently shut down for orders.

In Big Sandy gas field, Kentucky-West Virginia Gas Co. recorded one completion for the week, 5857 William Blackburn, in Pike County, finishing as a dry hole at 3,575 ft. in the Devonian black shales.

EASTERN KENTUCKY WILDCAT FAILURE

Fleming County: Salmons & Caudill 1 J. F. Bradley, 14-V-71, dry, TD 850 ft. in upper Ordovician, no shows.

WESTERN KENTUCKY

OWENSBORO.—Production of the Birk City field in Henderson County is being extended westward by W. E. Hupp, W. Chenault and associates 1 J. J. Spencer, SE NW SE 17-P-27, which is estimated good for 40 to 50 bbl. of oil per day natural from Tar Springs sand at 1,266-72 ft. with testing still under way. Drilling has been started in a north offset, 3 K. A. Jones.

The Morganfield pool in Union County also has what appears to be a good south extension well in Sun Oil Co. 1 H. C. Risinger, 3-N-19. At a total depth of 2,694 ft. in McClosky lime, 2,300 ft. of clean oil and 100 ft. of drilling mud was recovered in a drill-stem test, in which tool was open

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2 hours. Gas showed in 2 minutes. No water was indicated. Casing has been run to complete.

Sun Oil Co. 1-B Reburn, 22-O-19, a mile southwest of the pool, has been completed as a pumper good for 125 bbl. per day from Cypress sand at 2,267-91 ft. It not only is an extension for the pool but opens the first Cypress production for the area.

WESTERN KENTUCKY SUCCESSFUL WILDCAT

Union County: Sun Oil Co. 1-B J. Reburn, SE NE SE 22-O-19, IP 123 bbl., Cypress 2,267-86 ft., TD 2,393 ft. (Extension and new pay Morganfield pool.)

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WESTERN KENTUCKY WILDCAT FAILURES

Henderson County: Delta Drilling Co. 1 H. H. Poole, SE SW NW 23-O-23, dry, TD 1,808 ft.

Union County: D. E. Schock 1 C. E. Hancock, 8-O-20, dry, TD 2,795 ft.

INDIANA

EVANSVILLE.—A new producing area a mile southeast of the Patoka East pool in Gibson County appears to have been found by Winmar Oil Co. in its 1 Henry White, SW NE SW 29-1s-10w, which recovered 100 ft. of clean oil and 230 ft. of oil-cut mud on a drill-stem test of Cypress sand at 1,667-90 ft. A substantial volume of gas was indicated. On the basis of the test, operators have run 7-in. casing, which was cemented at 1,670 ft.

Another new pool also is indicated by showings encountered by Gilliam Drilling Co. in its 1 Huntworth, NW NW SE 20-10n-8w, 12 miles south of Terre Haute, in Vigo County. A drill-stem test of the Devonian at 1,850-75 ft. resulted in a recovery of 30 ft. of clean oil and 60 ft. of oil-cut mud. Total depth of the hole is 1,984 ft. with 5½-in. casing at 1,974 ft.

Charles C. Clark 1 Joe Goedde, NE NE SW 24-5s-12w, east extension test for the St. Wendells pool in Posey County, has been completed as a 50-bbl. pumper in Cypress sand at 2,346-54 ft. It is located in the narrow area between the above pool and the Vienna pool to the east in Vanderburgh County.

INDIANA WILDCAT FAILURES

Daviess County: Illinois Mid-Continent Co. 1 I. J. Ross, NW NE NW 32-2n-7w, dry, TD 1,452 ft.

Gibson County: Magnolia Petroleum Co. 1 Ballard, NE NE SW 12-4s-10w, dry, TD 2,150 ft.

Posey County: Sam Garfield 1 E. Rogers Comm., NE NE SW 11-4s-12w, dry, 2,370 ft.

T. B. Dirickson 1 Ashworth, NW NW NW 15-7s-14w, dry, TD 2,910 ft.

Indiana Farm Bureau 1 Ashworth, NE NE SE 34-7s-14w, dry, TD 2,871 ft.

Spencer County: C. A. Busick 1 J. Weigand, NE NE NW 23-5s-4w, dry, TD 714 ft.

Sullivan County: Bancroft-Mitchell 1 Hardesty, SW SE NE 3-6n-8w, dry, TD 2,558 ft.

Vigo County: F. B. Cline 1-A Hunt, NW NW NE 34-10n-10w, dry, TD 2,370 ft.

Warrick County: Sunlight Coal Co. 1 Leslie, NW NW SW 24-5s-9w, dry, TD 1,936 ft.

APPALACHIAN FIELD

Shallow Gas Well Gages 1,500,000 Cu. ft.

PITTSBURGH.—A good shallow sand gas well was brought in in Nicholson Township, Fayette County, Pennsylvania, J. H. Cornell et al 2 George Deffenbaugh, 1,500,000 cu. ft. of gas, Big Injun sand 1,250 ft., gas 1,261-70 ft., total depth 1,270 ft. In Napier Township, Bedford County, South Penn et al-Snee & Eberly 1 Jessee B. Miller, elevation 1,666 ft., is drilling at 3,521 ft. In Wharton Township, Fayette County, William E. Snee et al 3 Indian Creek Coal & Coke Co., elevation 2,615 ft., is drilling at 1,356 ft.

In Portland district, Preston County, West Virginia, Nollem Oil & Gas Co.-Snee & Eberly 1 Hugh R. & James A. Fitzpatrick, elevation 2,228 ft., is drilling at 5,763 ft. with no further show of gas. In Reno district, Snee & Eberly 1 Dola E. Dever, elevation 1,508 ft., is drilling at 3,800 ft. The Benson sand was reported in this well at 1,903-52 ft. In Beaver Pond district, Mercer County, United Fuel Gas Co. 6478 A. W. Hicks, elevation 2,834 ft., is drilling at 3,092 ft.

THE OIL AND GAS JOURNAL

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June Sees New Records in Both Completions and Footage Drilled

by Polly DeArmond

NEW all-year highs in both completions and footage drilled were set during June. A total of 3,673 completions for the month surpassed May's record of 3,149 by 524 wells, and footage topped March's 11,534,624-ft. peak by 1,704,901 ft. to reach 13,239,525 ft. Out of a total of 3,553 wells drilled for oil or gas, 2,330 were successful, and 1,223 were dry holes.

Gains Over May

In the comparison between June and May, four areas noted gains in both completions and footage. The Eastern area, including New York, Pennsylvania, West Virginia, and Virginia, was up 33.8 per cent in wells and 35 per cent in total number of feet drilled. The North Central section (Ohio, Indiana, Kentucky, Illinois, and Michigan) gained 2.8 per cent in completions and 3.8 per cent in footage. Texas - New Mexico-Arizona increased 32 per cent in wells and 33.9 per cent in footage. The Southern states of Louisiana, Arkansas, Mississippi, Alabama, Georgia, Florida, and Tennessee completed almost half again as many wells as in the previous month for a 49.5 per cent gain, with a 31.1 per cent rise in footage.

The Rocky Mountain region, made up of Colorado, Utah, Montana, Wyoming, and South Dakota, finished 12.5 per cent more wells than in May, but fell off 11.2 per cent in footage. California dropped only one well, and showed an increase of 16.8 per cent in footage drilled. The Mid-Continent division (Oklahoma, Kansas, Nebraska, and Missouri) reported declines in both categories: 3.8 per cent in completions, and 8.4 per cent in footage.

June 1949 vs. June 1948

Tabulations for June showed increases of 11.6 per cent in wells and 21.3 per cent in footage over June 1948 (also a record holder for the first 6 months of last year). The Texas division reported gains of 53.9 per cent in completions and 54.8 per cent in footage. In the Southern states, wells were up 23 per cent, and footage rose 27.4 per cent.

California reflected a small gain of 6.6 per cent in wells with a large increase of 38.9 per cent in footage, compared with the same month of last year. The North Central section's completions were up 4.1 per cent while footage was up less than 1 per cent. The Rocky Mountain region recorded a gain of 11.2 per cent in wells, but a 7 per cent drop in footage.

Activity in the Eastern fields continued its downward trend; completions were off 39 per cent from those reported for June 1948, and footage declined 33.9 per cent. The Mid-Continent noted declines of 6.9 per cent in wells and 9.6 per cent in footage.

SUMMARY OF COMPLETIONS, JUNE 1949

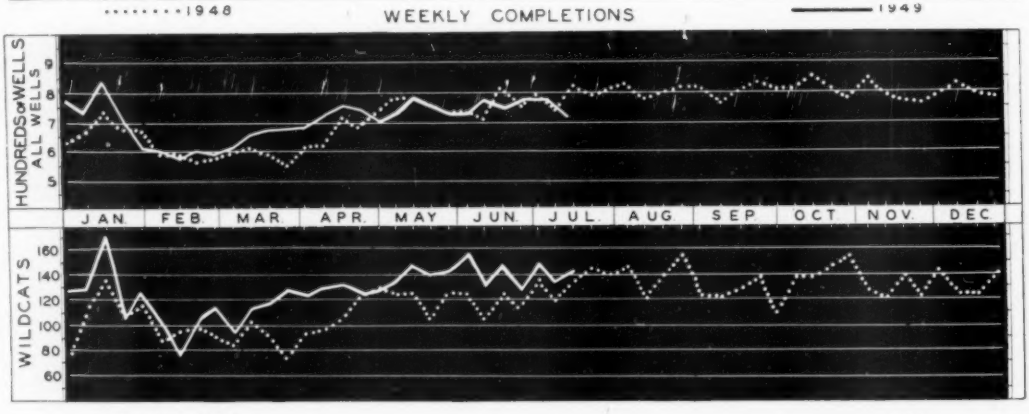
	Total comp.	Oil	Gas	Dry	Under 2,500 ft.	2,500-5,000 ft.	5,000-7,500 ft.	7,500-10,000 ft.	10,000-12,500 ft.	Over 12,500 ft.	Total footage	Rigs and drilling
New York	54	27	0	27	54	0	0	0	0	0	75,502	116
Pennsylvania	185	97	22	66	169	16	0	0	0	0	301,446	240
West Virginia	42	6	32	4	17	18	7	0	0	0	138,446	148
Ohio	65	22	19	24	42	23	0	0	0	0	133,470	132
Indiana	100	45	1	54	76	24	0	0	0	0	196,491	157
Kentucky	72	30	10	32	54	18	0	0	0	0	111,178	60
Illinois	263	141	0	122	96	167	0	0	0	0	662,273	281
Michigan	116	56	0	60	80	36	0	0	0	0	256,821	138
Kansas	284	148	29	107	44	240	0	0	0	0	895,352	409
Neb., Mo., Iowa	0	0	0	0	0	0	0	0	0	0	0	10
Oklahoma	398	208	26	164	150	175	57	11	4	1	1,324,823	597
Texas	1,404	857	63	484	384	572	301	123	22	2	5,922,048	1,230
North	263	137	1	125	145	84	34	0	0	0	722,118	164
West Central	193	91	5	97	66	112	15	0	0	0	591,189	188
West	411	331	4	76	86	165	92	52	14	2	2,021,711	389
Panhandle	80	61	18	1	1	79	0	0	0	0	259,988	91
East	54	31	3	20	4	31	14	5	0	0	265,096	63
Gulf Coast	216	122	18	76	32	45	79	52	8	0	1,255,523	184
Southwest	187	84	14	89	50	56	67	14	0	0	806,423	151
Louisiana	235	147	21	67	103	26	30	38	34	4	1,214,715	285
Northern	142	89	18	35	101	15	16	8	2	0	418,413	120
Southern	93	58	3	32	2	11	14	30	32	4	796,302	165
Arkansas	32	20	1	11	5	22	2	3	0	0	127,246	47
Mississippi	33	12	1	20	0	5	15	5	8	0	229,725	24
Ala., Ga., Fla.	2	1	0	1	1	0	0	0	1	0	14,627	9
Tennessee	3	0	0	3	3	0	0	0	0	0	3,026	7
Montana	33	14	5	14	26	7	0	0	0	0	63,832	111
Wyoming	§50	30	0	§20	6	39	4	0	1	0	192,783	‖166
Colorado	3	0	0	3	1	1	1	0	0	0	11,005	30
Utah	4	4	0	0	1	3	0	0	0	0	14,522	29
New Mexico	†52	37	5	†10	9	28	11	2	0	2	220 519	122
California	243	188	5	50	69	88	42	21	22	1	1,129,675	205
Total June 1949	3,673	‡2,090	240	*1,343	1,390	1,508	470	203	92	10	13,239,525	‡4,553
Total May 1949 (revised)	3,149	1,763	237	1,149	1,135	1,395	371	158	77	13	11,202,307	4,685
Total June 1948	3,289	1,859	222	1,208	1,345	1,373	342	164	65		10,919,052	4,751
Cumulative, 1949	18,519	10,465	1,308	6,746	6,805	7,699	2,398	1,076	475	66	67,172,396	
Cumulative, 1948	17,896	10,299	1,294	6,303	7,170	7,307	2,050	928	441		61,571,246	

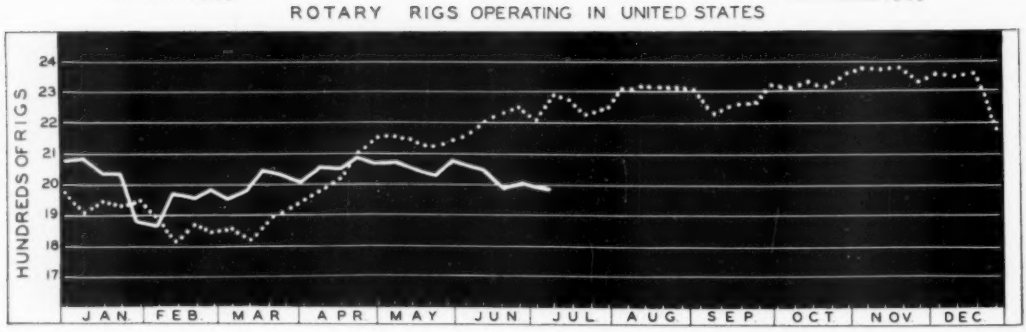
*Incl. 120 service wells: N. Y. 27, Pa. 63, Ohio 2, Ill. 1, Mich. 16, Okla. 4, No. Tex. 5, Ark. 2. †Incl. 35 distillate wells: Okla. 1, W. Tex. 2, E. Tex. 2, Tex. Gulf 11, S.W. Tex. 1, No. La. 8, So. La. 10. ‡Incl. all wells rigged up and/or drilling at end of month. §Incl. 3 So. Dak. at 3,929 ft. ‖Incl. 1 Ariz. at 3,734 ft. ‖Incl. 5 Dak.

WEEKLY WELL COMPLETIONS . . . . . WEEK ENDED JULY 16, 1949

	Total of all wells					28 wk.		Wildcat completions and discoveries					Cumulative total, 1949				
	Comp.	Oil	Gas	Dry	Footage	1949	1948	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	13	7	0	*6	14,756	584	808	0	0	0	0	0	0	0	0	0	0
Pennsylvania	20	5	7	†8	40,471	845	1,388	0	0	0	0	0	0	0	1	1	2
West Virginia	6	0	6	0	19,100	256	416	0	0	0	0	0	1	0	6	6	13
Ohio	17	5	6	6	32,466	560	698	0	0	0	2	2	1	0	2	21	24
Indiana	38	12	1	25	50,004	657	534	0	0	0	9	9	12	0	0	129	141
Kentucky	12	3	3	6	22,577	457	343	1	0	0	3	4	11	0	0	35	46
Illinois	65	35	0	30	139,267	1,270	1,140	0	0	0	10	10	27	0	1	206	234
Michigan	15	6	1	†8	33,436	504	388	0	0	0	2	2	19	0	1	160	180
Kansas	76	35	14	§27	241,542	1,629	1,571	2	0	0	9	11	34	0	4	208	246
Neb., Mo., Iowa	1	0	0	1	2,670	13	2	0	0	0	1	1	0	0	0	9	9
Oklahoma	91	44	2	§45	339,220	2,246	2,108	3	0	0	22	25	83	9	10	326	428
Texas	211	129	10	72	799,000	7,101	5,987	9	0	2	44	55	216	30	65	1,234	1,545
North Central (Dist. 7-B & 9)	88	49	0	39	243,513	2,316	1,838	4	0	0	19	23	93	0	10	483	586
West (Dist. 7-C & 8)	41	33	1	7	187,197	1,696	1,647	1	0	1	6	8	30	0	3	145	178
Panhandle (Dist. 10)	23	16	5	2	69,432	577	308	0	0	0	0	0	1	0	0	3	4
Eastern (Dist. 5, 6, & 6-P)	5	3	1	1	25,585	357	274	2	0	0	0	2	5	2	3	74	84
Gulf Coast (Dist. 2 & 3)	24	13	2	9	155,652	1,058	953	2	0	1	7	10	48	22	30	209	309
Southwest (Dist. 1 & 4)	30	15	1	14	117,621	1,097	967	0	0	0	12	12	39	6	19	320	384
Louisiana	45	21	6	18	239,208	1,110	1,128	2	0	0	5	7	32	10	3	112	157
Northern	26	12	5	9	69,476	602	743	0	0	0	1	1	1	2	0	47	50
Southern	19	9	1	9	169,732	508	385	2	0	0	4	6	31	8	3	65	107
Arkansas	6	2	0	4	32,257	160	149	1	0	0	1	2	3	0	0	31	34
Mississippi	4	2	0	2	27,863	191	207	0	0	0	1	1	4	0	1	55	60
Southeastern States	1	0	0	1	6,070	25	26	0	0	0	1	1	1	0	0	22	23
Montana	13	10	2	1	25,912	126	132	1	0	0	1	2	2	0	1	18	21
Wyoming	14	9	0	5	67,488	319	243	0	0	0	2	2	16	0	0	56	72
Colorado-Utah	0	0	0	0	0	67	129	0	0	0	0	0	1	0	0	28	29
New Mexico	8	6	0	2	55,890	288	327	1	0	0	2	3	7	0	0	30	37
California	47	37	0	10	187,864	1,451	1,510	0	0	0	5	5	26	0	5	244	275
Total United States	703	368	58	277	2,377,061	19,859	19,234	20	0	2	120	142	496	49	100	2,931	3,576
Total previous week	788	442	68	278	2,836,436	19,156	18,412	22	1	7	104	134	476	49	98	2,811	3,434
Total July 17, 1948	822	462	49	311	2,819,029			23	2	3	105	133	435	38	142	2,522	3,137

Service wells included: *6, †7, ‡4, §1.





DAILY AVERAGE PRODUCTION FOR WEEK

	July 16 crude oil	B. of M. July demand	July 9 crude oil
Alabama	1,200	1,350	1,200
Arkansas	72,600	87,000	72,600
California	911,900	928,000	914,200
Colorado	65,200	65,000	65,750
Eastern	61,000	60,850	61,600
Florida	1,375	1,400	1,425
Illinois	178,900	170,000	179,700
Indiana	26,300	24,000	24,200
Kansas	228,700	302,000	245,950
Kentucky	23,500	21,000	23,200
Louisiana	473,950	510,000	474,050
North Louisiana	105,900		106,000
South Louisiana	368,050		368,050
Michigan	38,100	46,000	39,700
Mississippi	96,700	109,000	91,950
Montana	27,500	24,000	28,500
Nebraska	600	700	600
New Mexico	136,300	131,000	136,300
Oklahoma	377,550	410,000	386,300
Texas	1,805,000	2,150,000	1,805,000
Dist. 1 (Southwest)	25,570		25,570
Dist. 2 (Southwest)	108,825		108,825
Dist. 4 (Southwest)	174,675		174,675
Dist. 3 (Gulf Coast)	334,905		334,905
Dist. 5 (Eastern)	32,150		32,150
Dist. 6 (Eastern)	78,700		78,700
East Texas field	221,000		221,000
Dist. 7-C (West)	41,425		41,425
Dist. 8 (West)	499,375		499,375
Dist. 7-B (W. Central)	57,400		57,400
Dist. 9 (N. Central)	137,175		137,175
Dist. 10 (Panhandle)	93,800		93,800
Utah	950	700	850
Wyoming	126,600	118,000	127,800
Total United States	*4,653,925	5,160,000	4,680,875
Change from prev. wk., down	26,950		
Canada	58,515		57,590

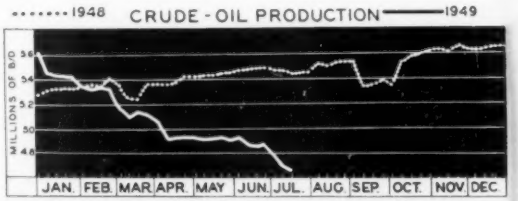
Total U. S. Production January 1-July 16 †1,014,286,305 bbl.
Same period last year (crude plus cond.) 1,082,079,540 bbl.

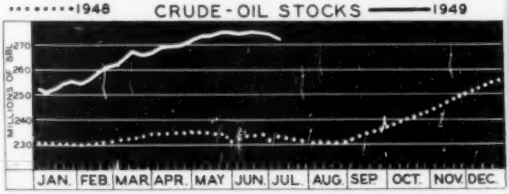
Not Incl. 78,730 bbl. condensate. †Incl. 16,450,270 bbl. condensate.

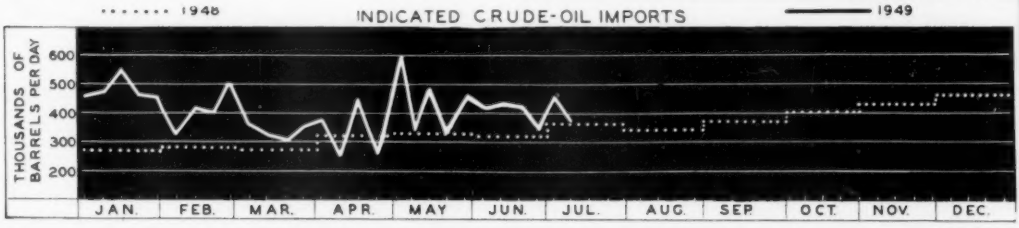
CRUDE STOCKS BY STATES OF ORIGIN

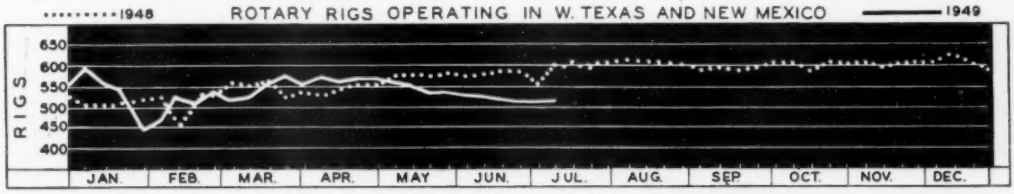
(Thousands of barrels)

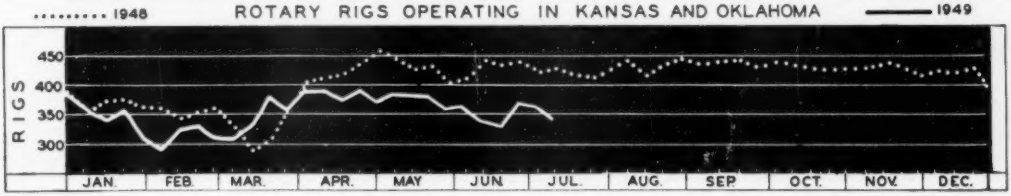
State of origin—	July 9, 1949	July 2, 1949	July 10, 1948
Pennsylvania Grade	3,009	3,048	2,702
Other Appalachian	2,251	1,965	981
Ill., Ind., Mich.	14,443	14,356	11,145
Arkansas	2,953	3,022	2,657
Louisiana	14,587	14,999	11,317
North	3,432	3,384	3,223
Gulf	11,155	11,615	8,094
Mississippi	2,917	3,178	2,613
New Mexico	7,576	7,642	5,500
Oklahoma and Kansas	39,174	40,152	34,447
Texas	128,352	129,249	111,221
East Texas	17,714	18,272	15,183
West Texas	51,746	51,568	42,804
Texas Gulf	30,046	30,150	28,739
Other Texas	28,846	29,259	24,495
Rocky Mountain	13,955	13,907	9,164
California	34,896	34,651	30,660
Foreign	7,807	8,144	4,966
Total United States	271,920	274,313	227,373











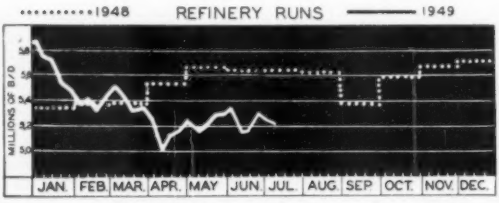
Refining Statistics

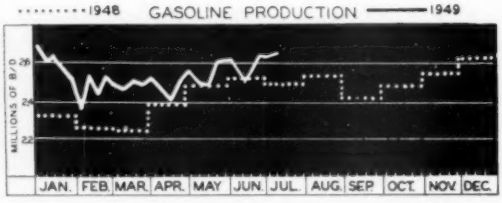
A.P.I. REFINERY REPORT, JULY 9

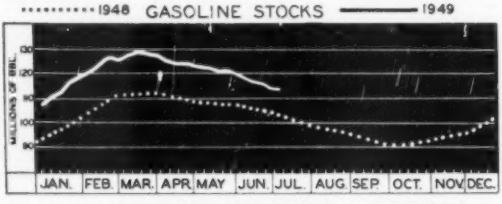
(Thousands of barrels)

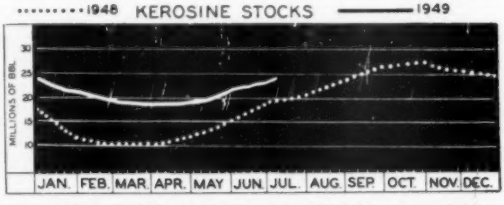
District—	Crude runs daily avg.	Daily average production				Stocks at refineries, bulk terminals, in transit and in pipe lines				Bureau of Mines, July 1948				
		Gasoline*	Kerosine	Distillate	Residual	Gasoline†	Kerosine	Distillate	Residual	Daily avg. crude runs	Daily average production			
											Gasoline*	Kerosine	Distillate	Residual
East Coast	711	324.2	26.3	146.0	155.6	26,800	9,881	21,982	9,656	891	320.7	43.5	170.6	222.6
Appalachian:														
District 1	85	36.4	2.9	7.0	9.7	2,554	423	679	508	93	40.0	4.8	12.1	11.1
District 2	64	36.1	1.0	6.9	6.0	1,073	164	200	315	36	15.5	1.1	4.6	10.0
Ind., Ill., Ky.	888	499.6	45.8	117.8	133.2	24,428	4,201	10,532	5,504	932	491.5	52.0	128.0	154.7
Okla., Kans., Mo.	427	245.7	9.3	81.9	60.1	11,423	1,444	5,005	2,466	483	246.2	22.8	87.0	79.0
Inland Texas	232	143.0	12.6	17.3	50.7	4,063	630	833	1,246	248	144.8	8.2	31.0	60.2
Texas Gulf Coast	1,250	654.0	70.6	179.1	229.9	15,591	3,494	10,079	8,351	1,395	601.5	102.8	295.2	259.9
La. Gulf Coast	376	213.3	38.3	74.9	41.7	5,158	2,311	4,379	2,097	435	185.5	45.1	92.7	77.9
N. La. and Ark.	76	28.1	4.4	10.4	15.1	2,716	405	926	249	84	30.5	7.5	12.2	19.5
Rocky Mountain:														
New Mexico	12	6.6		1.9	3.0	64	25	85	36	12	6.0	0.4	1.7	3.6
Other Rocky Mtn.	170	79.0	6.0	29.4	33.9	3,044	326	1,479	871	151	61.3	3.9	24.0	28.9
California	910	385.3	9.4	151.4	386.7	16,849	751	10,441	35,837	871	351.4	12.5	135.1	336.4
July 9, 1949‡	5,701	2,651.3	224.6	827.0	1,125.6	113,763	24,055	66,620	67,136	5,631	2,494.9	304.6	994.2	1,263.8
July 2, 1949	5,241	2,642.6	224.8	777.1	1,104.7	114,000	23,617	64,587	65,741					

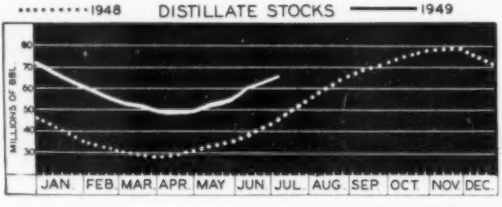
*At refineries including natural blended. †Finished and unfinished. ‡Comparable data for 1948 on new basis not available.

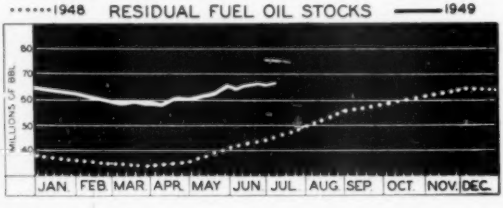


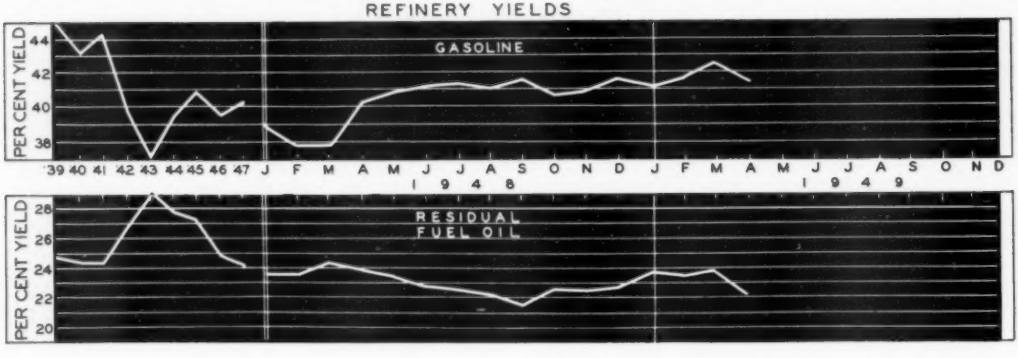











REFINERY YIELDS
GASOLINE
PER CENT YIELD
39 40 41 42 43 44 45 46 47 J F M A M J J A S O N D J F M A M J J A S O N D
1948
1949
RESIDUAL FUEL OIL
PER CENT YIELD

CRUDE PRICES GRAVITY SCHEDULE

Gravity—	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$1.78			
19-19.9	1.85			
20-20.9	1.93	$2.25		$2.12
21-21.9	2.00	2.27		2.14
22-22.9	2.07	2.29		2.16
23-23.9	2.13	2.31		2.18
24-24.9	2.20	2.33	$2.56	2.20
25-25.9	2.26	2.35	2.58	2.22
26-26.9	2.31	2.37	2.60	2.24
27-27.9	2.37	2.39	2.62	2.26
28-28.9	2.42	2.41	2.64	2.28
29-29.9	2.48	2.43	2.66	2.30
30-30.9	2.54	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.64	2.49	2.72	2.36
33-33.9		2.51	2.74	2.38
34-34.9		2.53	2.76	2.40
35-35.9		2.55	2.78	2.42
36-36.9		2.57	2.80	2.44
37-37.9		2.59	2.82	2.46
38-38.9		2.61	2.84	2.48
39-39.9		2.63	2.86	2.50
40 and above		2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947. Above changes do not include recent reductions of a few buyers applying principally to low-gravity grades.

FLAT CRUDE PRICES

Representative posted schedules per barrel	
East Texas†	$2.65
Kettleman Hills, California*	2.77
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	3.40
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37°-37.9°. †35° and above

THE reduction in gasoline stocks in the week following Independence Day was disappointing and when stocks alone are considered the drop of only 327,000 bbl. was small for a week in the middle of the gasoline season. The real reason for this very small reduction as well as the continuing high level of gasoline stocks has been high gasoline yields and not a lack of demand for gasoline.

Refinery gasoline demand for the 2 weeks including Independence Day week end was 2 per cent higher than for the 2-week period of Decoration Day at the end of May. This is a near-normal increase for the two holiday periods. The gasoline stock chart on the opposite page shows that stocks have dropped faster this year than last and are now nearer the 1948 level than at the middle of March. However, most operators would like to see primary inventories down to about 95,000,000 bbl. by Labor Day. This would mean a reduction of about 18,000,000 bbl. or about 2,250,000 bbl. per week, and such a rate does not seem likely under present conditions.

If normal summer deliveries of heating oils are delayed until the end of this quarter, demand for distillates in the last quarter may be so high that refinery runs will have to be increased materially. Even subnormal yields of gasoline from these runs, if combined with high stocks at the end of the summer, may raise gasoline inventories enough to cause storage difficulties next winter.

It is too early for increases in distillates sales resulting from summer fillup discounts, but suppliers are watching market data for any upward trend in demand.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of July 18, 1949. Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Tex. Gulf Coast
Regular gasoline, 73-75 octane	9⅝-9⅞	11-11.5	9½-10
Premium gasoline, 78-80 octane	10⅜-11	12-12.5	10½-11
42-44 w.w. kerosine	8-8½	7.5-8.4	7.50-8
No. 2 straw fuel oil	6½-7	6.5-7.4	6⅜-6½
No. 6 residual	$0.85-0.90	$1.60	$1.25-1.35

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	5½	5	5¼
Grade 18-55	6.6	6	6.3

LUBRICATING OILS
South Texas

200 vis., No. 2-3 neutral	11
750 vis., No. 3-4 neutral	14
2,000 No. 5-6 neutral	16-16.5

LUBRICATING OILS
Mid-Continent

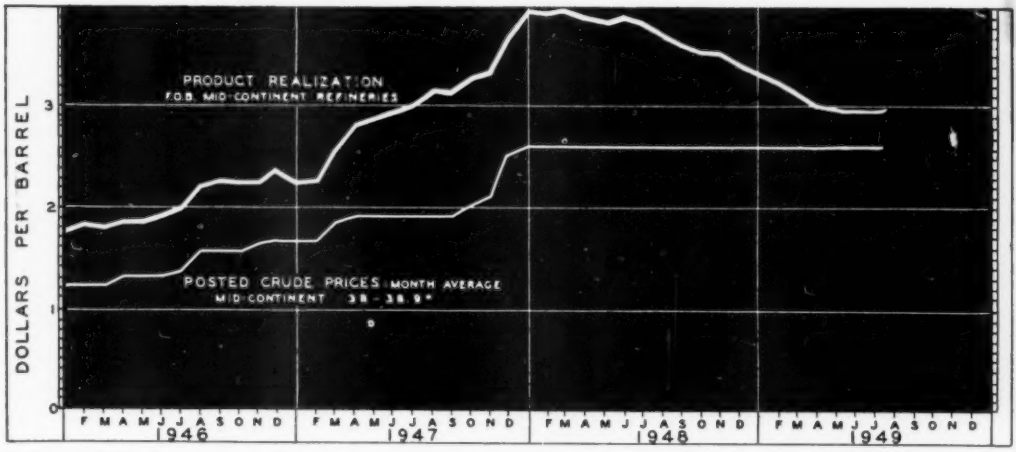
150-160 vis., D bright stock, 0-10 pp.	19
200 vis., No. 3 neutral, 0-10 pp.	12-14

Western Pennsylvania

144-155 vis., 10 p.t. bright stock	19.5
180 vis., 0 p.t. neutral	20.5

CRUDE-SCALE WAX
Mid-Continent

132-134 A.M.P.	4.5



In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate, and fuel oil

$1,500 inventory abolished – at a cost of $4.46!

With more than 700 vacuum tubes needed by industry, a tube distributor would find profits consumed by 100% inventories. But by ordering tubes as needed via Air Express, he holds stocks to 25%. Example: Orders $1,500 tube at 9 A.M. from supplier 900 miles away. Delivered to customer 6 P.M. same day 16 lbs.: cost, $4.46.

Remember, $4.46 *included* speedy pick-up and delivery service, too. *More* protection, because you get a receipt for every shipment. Air Express is the *world's fastest* shipping service.

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The Original composition valve cup *still the best!*

YOU'LL SAVE MONEY BECAUSE..

• Precise control of all materials and processes from lab to well means exceptional resistance to wear and deterioration . . . fewer pulling jobs! • Different textures, scientifically developed, fully proved, give peak efficiency and longer flex-life at any depth! • Precisely controlled sizes for any make or size pump . . . no misfit inefficiency! • Ask for genuine Darcovas at your supply store.

DARLING VALVE & MANUFACTURING COMPANY
WILLIAMSPORT 1, PA.
DARCOVA ®
THE ORIGINAL COMPOSITION CUP

EQUIPMENT MEN . . . in the News

H. V. Smith Made General Manager for Rolo

H. Vernon Smith, former chief engineer of Parkersburg Rig & Reel Co.'s Houston plant, is new general manager of Rolo Manufacturing Co., Houston, according to R. K. Franklin, founder and owner of Rolo.

H. V. SMITH

The new Rolo manager succeeds W. A. Swan, who has moved from Houston to the Rocky Mountain area to manage the company's business in that section as well as Rolo, Ltd., in Canada.

Smith received a petroleum-engineering degree from University of Oklahoma in 1940, then for 15 months was associated with W. C. McBride, Inc., Tulsa independent producing company. In 1941, he joined Twin Disc Clutch Co. as experimental and sales engineer. He joined Parkersburg in 1944 as design engineer and was transferred in 1947 to the Houston plant as assistant chief engineer. In 1948 he became chief engineer.

L. W. Bartheld Made Tulsa Representative by Bovaird

L. W. BARTHELD

L. W. Bartheld, for many years West Texas district manager of Bovaird Supply Co. at Odessa, Tex., has been made Tulsa representative of the company, it was announced by Davis D. Bovaird, president.

Bartheld has been with Bovaird for 13 years. Prior to that he was with Oil Well Supply Co. for 9 years, starting in 1927 as a part-time employe while attending University of Oklahoma, from which he graduated in 1929 with a degree in business administration.

Capaul and Solon Get Glass Fibers Appointments

Appointment of R. W. Capaul as general sales manager and F. J. Solon, Jr., as director of advertising and public relations of Glass Fibers, Inc., Waterville, Ohio, has been announced by R. H. Barnard, president.

Capaul formerly was in the power sales division of Toledo Edison Co. for 12 years. An engineering graduate of University of Toledo, he is a member of Ohio State Society of Professional Engineers, Wire Association, National Electrical Manufacturers Association, and National Association of Corrosion Engineers.

Before joining Glass Fibers, Solon was with the advertised drug division of American Home Products Corp., New York.

Ed Steele Opens Own Office in Bakersfield

Ed Steele, former San Joaquin Valley manager for Oil Base, Inc., and a well-known mud consultant in California, has opened his own offices in Bakersfield. He will continue to serve all fields throughout the San Joaquin Valley.

Steele was previously service manager for Baroid in California, manager for Macco Antelope Materials Co., and mud engineer for Bell & Loffland in the California territory. Recently he conducted the mud school for the American Association of Drilling Contractors in Bakersfield.

H. T. Brown Elected Geolograph Director

H. T. Brown, secretary treasurer of Geolograph Co., Inc., Oklahoma City, has recently been elected a director of the corporation. Prior to joining Geolograph in 1947, Brown worked 17 years in geology and engineering with Cities Service Oil Co.

Crucible Shows New $18,000,000 Plant

A new $18,000,000 steel plant, designed throughout for continuous hot and cold rolling of stainless and high-alloy sheet and strip steels, was demonstrated in Midland, Pa., recently by Crucible Steel Co. of America at its Midland works. The new plant occupies ¾ mile of interconnected buildings, with 535,000 sq. ft. of process and operating space.

The visitors, headed by William P. Snyder, Jr., chairman, and W. H. Colvin, Jr., president, saw the operations of the most distinctive combination of equipment and facilities yet assembled, to hot and cold-finish precision sheets and strip made of the

(Continued on page 149)

New York Nomads Hold Golf Party

Members and guests of the New York Chapter of Nomads who won foursome prizes at the party held in June at the Pomonok Country Club on Long Island. Foursome winners received sport shirts or golf balls

Classified Advertising

The Market Place for the Oil Industry

UNDISPLAYED

All ads, 12 cents a word. Minimum charge, $3.00 per insertion.
Centered Line, any ad, $1.00.
Box Numbers count 9 words when replies are to be sent to our Tulsa Office. Replies forwarded without charge.

DISPLAYED, PER INCH

$12.00 per column inch per insertion. One-point border and 12-point capitals are allowed. Larger type sizes not accepted.

All classified advertising payable in advance.
10% Discount if 3 insertions are ordered at one time.
COPY DEADLINE, 9:00 a.m. Monday prior to each week's issue.

THE OIL AND GAS JOURNAL
P. O. Box 1260, TULSA, OKLAHOMA

EQUIPMENT FOR SALE

FOR SALE: 10,000 ft. 20" OD x ¼" Wall New Electric Weld Steel Pipe, Double Random Lengths; 50,000 ft. 18" OD x ⅜" Wall Used Steel Pipe, Single Random Lengths. Utility & Industrial Supply Company, 921 Michigan Ave., E., Jackson, Michigan.

FOR SALE: One National Shot Hole Drill, solid kelly, Gardner-Denver pump, now working in West Texas. Also 500 gal. Dodge water truck. Box C-968, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: Failing "1500" portable rig for shot-hole, core, water-well, and shallow production drilling. Equipped with sand reel and bailer. Mounted on GMC truck. Rig and Truck in excellent condition. Rider & Montgomery, Box 523, Douglas, Wyoming.

MOBILE Core or Exploration Rotary Drilling Rig with capacity up to 3,000 feet. Fully equipped and with auxiliary trucks and trailers. Excellent condition. Phenomenal earning record. Now in operation on contract. Write or wire for full details. Box D-103, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE
Used Oil Field Gas Engines

* 3—Model 145 GKU Waukesha special oil field units with gas engine starters, gas, gasoline, and butane burning equipment, and otherwise standardly equipped, less power take-off, mounted on oil field type steel skids. Location Okla. City, Okla. Price, each $2,820.00

* 2—Model 6-PCS-1879 Buda standard oil field power units, with gas engine starters, gas, gasoline and butane burning equipment and otherwise standardly equipped, less power take-off, mounted on oil field type steel skids. Location Duncan, Okla. Price, each $6,624.00

* These engines are practically new and guaranteed accordingly.

* 1—R-225 Climax 8 cylinder engine complete with gas, gasoline and butan carburetors, and engine starter, mounted on oil field type steel skid. Location Duncan, Okla. Price "as is" $1,100.00

Address inquiries to Box D-108, The Oil and Gas Journal, Tulsa, Oklahoma.

EQUIPMENT FOR SALE

FOR SALE: Model "K" Cardwell, single drum draw works powered by G.A.K. Waukesha engine. Equipped with 98' "A" mast and sub skid. Priced for quick sale. Terms. Melton Supply Co., Seminole, Okla.

CASING, RIGS, BELTS, TANKS, ENGINES: Everything for Cable Tool Drilling. Bought and sold. Tri-State Oil & Gas Company, Box 827, Phone 7-5121, Parkersburg, W. Va.

HOT OIL PUMPS AND COMPRESSOR

1—Worthington horizontal duplex reciprocating pump, enclosed frame, outside end packed plungers, forged steel fluid end, water cooled stuffing boxes, stainless steel valves and seats, size 10x3x10. 1—Clark engine and compressor, engine 80 H.P., size 16" x 15" x 7¼" x 20", 200 R.P.M., compressor intake pressure 0 lbs. discharge pressure 350 lbs., type Q compressor cylinders. 1—Worthington 4" x 18", 4-6 chrome block, horizontal, duplex, double plunger, enclosed frame hot oil fitted power pump, driven by Worthington 12½" x 14" horizontal, double acting steam engine with some spare parts for engine. 1—Worthington 5¼" x 18", 4-6 chrome block, horizontal, duplex, double plunger, enclosed frame, hot oil fitted power pump with some spare parts, driven by Worthington 12½" x 14" horizontal, double acting steam engine with some spare parts. Equipment second hand, in good condition; spare parts new. American Liberty Oil Company, Mt. Pleasant, Texas.

PRICED TO SELL, QUICK DELIVERY

New and Used Welded Steel Tanks and Tool House. New and Used Bolted Steel Tanks and Separators. 6—10 ft. X 35 ft. Gasoline Tanks. 8—2,000 Gal. Gasoline Tanks, mounted on Semitrailers with Pumps, etc. 1—37,500 bbl. Tank, with Floating Roof. Write Independent Tank Co., Box 102, Phone 977, Seminole, Okla.

FOR SALE

Model KL Cardwell Double Drum Unit, with 145 GAK Waukesha engine, 67' mast lines, dog house, Kohler light plant, 7 & 5" tools practically new.

GRACO DRILLING CO.
P.O. Box 5213, Oklahoma City 7, Oklahoma

AMAZING BARGAIN

Brand new Sterling Stationary Power Plant, 70 to 200 H.P., 600 to 2,000 R.P.M.

Write

J. M. MACKIE
633 N. Water Street, Milwaukee 2, Wisconsin

NEW
FRACTIONATING TOWER
REFLUX DRUM

One (1) New fractionating tower, 5'-0" I.D. X 89'-6" over-all height X 1⅛" plate. Thirty-four (34) bubble trays, ten (10) 18"-300# manways. Stress relieved and built in accordance with API-ASME Code for 350 PSI working pressure.

One (1) new horizontal reflux drum, 5'-6" I.D. x 18'-6" over-all length x 1⅛" plate. Stress relieved and built in accordance with API-ASME Code for 350 PSI working pressure.

ROCK ISLAND OIL & REFINING CO., INC.
335 West Lewis St. Wichita, Kansas
Phone 7-3325

EQUIPMENT FOR SALE

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

FOR SALE, at Birch Run, Michigan. #50 Oilwell geared power complete. 30 H.P. 2 cycle Type C Superior gas engine. #50 Oilwell belt tightener complete with shaft, bearings, and clutch. Circulating tank. 16' x 19' house. All in good condition. $2000 as it stands. Was used to pump twenty-five 1540' wells in field now abandoned. Smith Petroleum Company, 401 Keeler Building, Grand Rapids, Michigan.

ONE—36L Bucyrus-Erie Spudder. New type and design, complete with steel dog house, Kohler Light Plant 1½KW, has 7" and 5" tools. (Note—This machine is in excellent condition). Priced $21,000.00. One New D7 Caterpillar Tractor, equipped with 8' LaPlante Choate inside bull-dozer, 3 speed, Hyster-winch. This tractor has less than 200 hours. Excellent shape. A. M. Perrine, P.O. Box 87, Salem, Illinois. Phone 1064 or 901W4.

ROTARY RIG, mounted on low-boy trailer; 45 foot telescoping A mast, fold back; National rotary table; Oil Well mud pump; Kohler light plant; tool house; 1200 feet 4½" drill pipe; core barrel; overshot, etc., all that is necessary for drilling well. Just completed 2000 foot hole. Bargain for quick cash sale. Write Box C-1000, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: 4000' 8⅝" OD 36# Range 2 & 3, 8V Long T&C Grade "D" No. 1 Casing. 1775' 5½" OD 14# J-55 No. 1 Casing. LEVERING MACHINE WORKS, Oklahoma City, Phone 6-1366, Box 4002.

PACKAGED H_2S REMOVAL UNITS

We offer prompt shipment on skid-mounted hydrogen sulfide removal units for treating sour gas for pipe line or fuel gas purposes.

GRAFF ENGINEERING & EQ'PT. CO.
3415 Westminster, Dallas 5, Texas

NEW
A.P.I. CASING COUPLINGS

1,441—5½" O.D., 8 R. T. Long N-80
794—5½" O.D., 8 R.T. Short J-55
79—6⅝" O.D., 8 R.T. Long J-55
100—7" O.D., 8 R. T. Long J-55
144—7" O.D., 10-V Long J-55
15—8⅝" O.D., 8 R.T. Long J-55

ROCK ISLAND OIL & REFINING CO., INC.
335 West Lewis Street
Wichita, Kansas Telephone 7-3325

FOR SALE
UNUSED
DISHED HEADS

2—ASME Flanged Dished Heads—151¼" O.D. x ⅝", 150" I.D., 144" Radius of Dish, 9⅛" ICR, 3" str. flg., Stainless Steel Type 304.

4—ASME Flanged Dished Heads—109½" O.D. x ¾", 108" I.D., 102" Radius of Dish, 6½" ICR, 3" str. flg., Stainless Steel Type 304.

Foster Wheeler Corporation

165 Broadway, New York 6, N. Y.

120,000′—6⅝″ OD, 17.65#, seamless, range 3, beveled.
80,000′—4½″ OD, 8.65#, seamless, range 3, beveled.
2—complete pumping stations. All pipe & equipment practically new. Sell any quantity. Located Tulsa.

W. C. BERRY
P.O. Box 1858 — Tulsa, Oklahoma — Phone: 3-6141

FOR SALE: 24-L Bucyrus-Erie Spudder. Reconditioned with dual pneumatic rear tires and trailer bracket, 40 ft. derrick, swabbing unit, power derrick hoist, Buda 6 cylinder engine. $4,500.00 Cash F.O.B. Princeton, Indiana. Randall-Zogg Supply Company.

FOR SALE: 1 Model "K" Cardwell spudding unit powered by D-8800 Caterpillar Diesel motor, 1500 watt covered Kohler light plant on skids. Folding steel flaps for roof and walks, and canvas for inclosure. All steel dog house. Stems, bits, and bailers for 7-in. and 5-in. hole. Rod, tubing, and hand tools. Everything complete for immediate use. Shamrock Drilling Company, Great Bend, Kansas, Phone 5732, P.O. Box 322.

Several Army Surplus 4½″ x 6″ Gaso Duplex 1860 Pumps—two piece skid mounted with Chrysler 8 cylinder engines. Will sell pumps only or complete units about half price.

H. H. COFFIELD
ATTN: W. H. Orr
Phones: 132—Rockdale, Texas
A-86064—Houston, Texas

COMBINED VAPOR SEPARATOR & FRACTIONATOR FOR THERMAL REFORMING

One (1) New 5′-6″ ID x 61′-0″ over-all height Bubble Tower made of 1¼″ Plate and lined throughout with 5/64″ and 7/64″ thick, 11-13% Chrome stainless steel, type 405. Stainless steel support plates in place for 15 Trays. (Trays not included). Constructed in accordance with the API-ASME Code, stress relieved and radiographed. Designed for 400 PSI @ 750° F. Fabricated by A. O. Smith Corporation. Platform and ladder clips installed.

WOOD RIVER OIL & REFINING CO., INC.
335 West Lewis Street, Wichita, Kansas
Telephone 7-3325

FOR SALE

CARDWELL MOBILHOIST complete with 5″ drilling tools, new 4000′ ¾″ drilling line (run about 100 hours), good 5000′ sand line, 4¾″ dart bailor and Midco Sand Pump, circle, circle jack, tool wrenches, and dog house. Unit is powered by 6MZ Waukesha which has recently been overhauled. Equipped with practically new 8⅝″ x 7″ (reinforced with 5½″) x 55′ single pole mast. Spudding chain and lines have only been run about 50 hours. Unit is in good operating condition.

Price is $7,000.00.

CARDWELL MODEL H SINGLE DRUM SERVICING UNIT, powered by SRK Waukesha and equipped with 8⅝″ x 7″ (reinforced by 5½″) x 55′ three sheave single pole mast. Also has spudding attachment which is not mounted. Unit has just been mounted on a 2½-ton Diamond T Truck that has been completely overhauled.

Price is $4,000.00.

CLARKE OIL WELL SERVICING COMPANY
520 South Turner — Telephone 27
Hobbs, New Mexico.

SAVE WITH SAFETY—Very Good Used Wire Line—Any Size or Length up to 5,000′—Respooled for Your Inspection—Cable Tools for Sale. General Tool & Supply Co., P.O. Box 4387, Phone 61335, Oklahoma City, Okla.

FOR SALE: Practically new 70 B Brewster Drawworks equipped with G. M. Diesel 6 Motor & transmission, all friction clutches—automatic cathead. This drawworks has drilled 35,000 feet in shallow wells—being replaced by larger unit. Price $10,000.00 f.o.b. Salem, Illinois. Herman Graham Drilling Co., Box 176, Salem, Illinois. Phone 580.

FOR SALE: 1 UMT Allis-Chalmers tractor on new rubber with Cooper Winch. Price $1,000.00. 1 Skid type Cooper Unit—Price $2,000.00. 1 Skid type Cardwell H Spudder with MZR Waukesha Motor. New string of five inch tools with quick change-over sockets. New 4,000 foot line. Price $5,000.00. Also have Cardwell Model QS Unit with telescope pole. Mounted on truck. Might sell. These Units are in good condition and suitable for wells up to 3,500 ft. Fred Frogge, Leon, Kansas. Phone No's 4316 or 2952.

FOR SALE: A-1 quality pipe; 30,000′ 5½″ O.D. 14#; 100,000′ 2″ line pipe; 25,000′ 2⅜″ 4½# upset tubing. Prices very reasonable. Write, wire, or phone The Interstate Pipe & Supply Company, Marietta, Ohio. Phone 2468.

SULLIVAN 22 Core Drill. Also truck mounted cable tool rig. Both only slightly used. Excellent condition throughout. R. B. McElwaine, Box 127, Little Rock, Ark.

MANUFACTURERS LATEST DESIGN

Hydraulic Casing Pulling Units. Complete line of equipment. Units made to your specifications. Truck Mountings or Skid Units. Repair Service and Parts.

OKLAHOMA MACHINE & SUPPLY CO.
Ada, Oklahoma

NEW 6⅝″ O.D. API LINE PIPE

Seventy-three (73) Miles New 6⅝″ O.D. 13# API Electric Weld Line Pipe, Plain End, Beveled for Welding, Regular Mill Coating, double random length Van Dyke Protectors Applied. Rock Island Oil & Refining Co., Inc., 335 West Lewis Street, Wichita, Kans. Telephone 7-3325.

FOR SALE

12—230 H.P. Type 10 Bessemer New 17″ Power Cylinders complete ready to run with 16″ to 18″ Compressors. 1—230 H.P. Clark Horizontal with Compressors. Located Salem, Illinois.

ENGLE PETROLEUM, Incorporated
Box 655, Evansville, Indiana

COMPLETELY EQUIPPED
NEW HERCULES RXC
Gasoline Engines

Price of engines, with full equipment, is $1250 . . . less than usual cost of engine alone! PROMPT SERVICE IS ASSURED THROUGH NATIONAL FIELD ORGANIZATION.
Engine rating, 110 H.P. at 1800 r.p.m. Equipment includes: cast iron radiator; starter; Twin Disc clutch power take-off; heavy metal housing; all power controls; etc.

Wire or write
Box C-945, The Oil and Gas Journal, Tulsa, Oklahoma

1—Link Belt Company Portable screw conveyor unit with one 9″ Dia. by 13 ft. long screw feeder and one 4½″ Dia. by 8 ft. long screw feeder. Good condition. Ideal for mud mixing. Mr. Carruth, Sunray Oil Corporation, Philtower Building, Tulsa 3, Oklahoma.

FOR SALE: Wilson Giant draw works, powered by 2—J.L.-1335 Buda engines and Wilson chain compound. Like new condition, with bargain price. Terms. Melton Supply Co., Seminole, Okla.

NEW foreign and domestic Oil Employment Directory. Over 500 listings in drilling, production, refining, natural gasoline, pipelines, geological, exploration, supplies, manufacturers, services; and trucking, refinery and pipeline contractors, showing where to apply for jobs. Price $5.00. Oil Industry Mailing List, Box 2803, Tulsa, Okla. (Our 29th Year).

PETROLEUM SALES: Midwest independent has opening for executive man experienced in bright stocks and neutrals sales. Excellent opportunity for right man. In replying, give full information, including age, education, experience, salary required. Replies held confidential. Box C-999, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Superintendent for combination natural gasoline and L.P.G. plant in Texas Gulf Coast area. Give record of past experience. Address Box C-990, The Oil and Gas Journal, Tulsa, Oklahoma.

CONSTRUCTION MAN

For 2-year project, with civil engineering and pipe line building experience, top references. Address Box C-981, The Oil and Gas Journal, Tulsa, Oklahoma.

An old established supply distributor requires the services of a high grade pumping equipment sales engineer, age 35-45. Must have good Mid-Continent area contacts. Excellent opportunity for one who can produce. Give full particulars which will be kept strictly confidential. Box D-105, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED
MIDDLE EAST REPRESENTATIVE

An experienced oil-country representative to handle established Packing and Gasket line on commission basis in Middle East area. Well established company desires aggressive representation in Saudi Arabia, Iran, Iraq, Kuwait, etc.

BOX D-101
THE OIL AND GAS JOURNAL
TULSA, OKLAHOMA

ENGINEERING

During the next several months we will increase our Engineering Organization engaged in the design of Oil Refinery Plants and Power Plants. Location Cleveland, Ohio. The men we need should be qualified as draftsmen, designers, checkers or in higher engineering skills on design of piping, instrumentation, pressure vessels, structural steel, concrete, mechanical or electrical. For presenting your qualifications and prompt consideration, write to us for application form.

ARTHUR G. McKEE & CO.
2300 Chester Ave., Cleveland 1, Ohio

HELP WANTED

SALES ASSISTANT—PETROLEUM PRODUCTS MARKETING: Young man who would be able after reasonable time necessary to familiarize himself with our operations and organization to take over top sales management job handling disposition of products of gasoline plants and a refinery. This is a challenging job with an active well-rated independent company in Texas, and the salary is open. Box D-100, The Oil and Gas Journal, Tulsa, Oklahoma.

ASSISTANT SALES MANAGER: Large Midwest independent needs young aggressive man with good experience in petroleum sales for position of assistant sales manager. Expanding operations require high-type executive for this permanent position. In replying, give full details including age, education, and salary required. Replies confidential. Box C-996, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Seismologists for division office of major oil company. Men with considerable experience as party chiefs preferred. These positions very attractive for men with families who want to settle in permanent locations. Give full details of education and experience in first letter. All replies will be held confidential. Reply Box D-113, The Oil and Gas Journal, Tulsa, Oklahoma.

SITUATIONS WANTED

GEOPHYSICIST: Young married man, five years experience, four years in Venezuela as computor, party chief, and central office interpreter; thoroughly experienced in both interpretation and crew management, desires position preferably with permanent location, either in U. S. or foreign. Opportunity to assume responsibility and to advance in position more important than salary. Write Box C-998, The Oil and Gas Journal, Tulsa, Oklahoma.

EXPERIENCED Chemical Engineer: M.Sc., 30 yrs., two yrs. development, research experience organic chemicals, supervisory experience, desires production, technical service or development, presently employed. Box C-992, The Oil and Gas Journal, Tulsa, Okla.

ENGINEER-SUPERINTENDENT — M.S. in Ch.E., age 35, registered Texas engineer, thorough knowledge refining, nine years varied experience engineering and plant supervision, most recently manager small refinery, available at once due to plant shut down. Write WRS, Box 112, Winnsboro, Texas.

EXECUTIVE with thorough knowledge of refinery operations and materials desires to represent manufacturer of nationally advertised products. Box D-115, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM Engineer—23 years experience in drilling and production. Past ten years general production engineering. Supervisory experience in drilling, completion and production practices. Desire connection with active independent or would consider connection in sales engineering. Box D-114, The Oil and Gas Journal, Tulsa, Okla.

INDEPENDENT Petroleum Geologist with up-to-date Oklahoma Regional subsurface maps, records, and years of experience with major oil companies, desires combination office and field geological work from Tulsa headquarters. P. O. Box 1884, Tulsa, Oklahoma.

SALES ENGINEER, Houston resident, well acquainted and presently contacting Chemical, Refining, Allied Industries. Available short notice. Box D-111, The Oil and Gas Journal, Tulsa, Oklahoma.

GAS - GASOLINE executive with major company desires to make change. Graduate engineer with more than twenty years experience in all phases of gasoline and cycling plant operation and management. Box D-110, The Oil and Gas Journal, Tulsa, Okla.

MANAGEMENT of small substantial oil company operating in Texas wanted by operator of wide experience and with ample reference as to ability and responsibility. Prefer proposition with participation in results produced. Box D-107, The Oil and Gas Journal, Tulsa, Okla.

SITUATIONS WANTED

LANDMAN; many years major company experience; geological background; desire connection; company or independent operator. Box D-109, The Oil and Gas Journal, Tulsa, Oklahoma.

LEASE AND DRILLING BLOCKS

FOR SALE: Ohio 750′ Berea leases, 13 wells, 6 bbls. natural, proven locations to be drilled. Inexpensive. E. N. Rehler, Allegany, N. Y.

FOR SALE: Oil and Gas Leases and drilling propositions in shallow territory of Allen, Simpson, and Warren Counties, Kentucky. W. P. Harley, Bowling Green, Ky.

OIL and wet gas expansion and development practically unlimited in most all East Texas. Let us help with one, checkered, or a block of leases, also mineral rights and land. We have had 30 years' constant contact in this area, and know of many favorable localities. Box C-987, The Oil and Gas Journal, Tulsa, Oklahoma.

MAJOR POTENTIAL OIL FIELD

NEW MEXICO CHAVES CO.: Important Pennsylvania test high on top San Andreas shows favorable for production above 6000′. Major Co. support. Offer lease within 1½-2 miles of well at $15 to $20 p.a. high on structure & located in drilling block. Contour Map furnished. We specialize in Leases & Royalty under Major Co. operations.

W. J. PETERMAN, Geologist
Portales New Mexico

OIL LEASES

Following acres in States and Counties mentioned are offered subject to my final confirmation—

COLORADO—

800	Archuleta	$ 2.00
960	Moffat	3.50
1,280	Montezuma-Dove Cr.	10.00
3,000	Prowers	1.00
3,600	Yuma-choice	1.50

IDAHO—

4,000	Bonneville	3.50

MONTANA—

12,000	Toole	3.00
4,000	Toole	3.50
32,000	Teton	2.00

NEBRASKA—

2,500	Cheyenne-Sidney	Bid
480	Cheyenne-Sidney	Bid

NEW MEXICO—

800	DeBaca	2.50
1,000	Hardin	2.00
15,000	Rio Arriba	2.50
1,240	Roosevelt	2.50
4,000	Sandoval-choice	2.50
10,000	Torrance	2.00

OKLAHOMA—

Four farm-outs on proven leases in Garvin, Grant, McClain counties. Off-set wells. Costs and details, and operating management furnished if desired, very choice contract

OREGON—

80,000 Crook et al-choice-drill and 75

WYOMING—

1,600	Albany-Little Lar.	2.00
3,000	Albany-drill and	1.00
960	Big Horn	3.50
1,540	Crook	2.50
2,560	Niobrara	2.50
7,000	Park	2.50
5,120	Fremont-choice	2.50
7,600	Sweetwater	2.00
2,560	Weston-choice	2.00

15,000 Sweetwater-LaBarge area semi-proven seismographed 3 sands tested, known as Monument area, ½ int. purchaser to control operations. Price $30,000

UTAH—

28,000 Acres on structure in Garfield and Kane counties 2.00

Plats and descriptive circulars furnished free to proper parties. Call, phone (Ch-3576), write

F. W. Dyer
1835 Champa, Denver Colo.

LEASE AND DRILLING BLOCKS

WILL BUY oil leases anywhere, large or small blocks if any likelihood of oil field or good geology, provided you co-operate in furnishing all necessary information. Write fully what you have. Box 2153, Denver, Colo.

AVAILABLE some close up acreage to an Arbuckle test now drilling 700 ft. from an Arbuckle well which has 100 ft. of oil in it right now, will bail it. Write Box 254, Chetopa, Kansas.

WE BUY Salvage Oil Properties and small production. Ben H. Rosenthal, 1901 Republic Bank Bldg., Dallas, Texas.

LEASES ROYALTIES

PRODUCING OR NONPRODUCING

Texas, New Mexico, Oklahoma, Louisiana and Illinois

Inquiries Invited

B. D. BUCKLEY
60 Broadview Drive, Clayton (5), St. Louis, Missouri

MANUFACTURERS REPRESENTATIVE

MANUFACTURERS AGENT needs one or two good lines of oil field equipment for East Texas Territory. Must be strictly high class merchandise and sold only through accredited supply stores. We have excellent connections in this area and can adequately cover about 30 counties in East Texas and Western Louisiana. Address P. O. Box 526, Palestine, Texas.

WELL KNOWN and permanently established Manufacturers representative now selling Producers, Drilling Contractors and Supply Companies desires one additional manufacturers account on straight commission basis. Two men now working Oklahoma and Kansas and can furnish capable representative for other fields. Box D-106, The Oil and Gas Journal, Tulsa, Oklahoma.

BUSINESS OPPORTUNITIES

FOR SALE: Established Oil Well Servicing business in Illinois. Complete equipment, in good condition. Box D-112, The Oil and Gas Journal, Tulsa, Oklahoma.

LEGAL BLANKS

BURKHART LEGAL BLANKS since 1908. Oil-Gas (all states), Business, Real Estate, Legal Forms, Leases, Revised With Government Regulations, Commercial Printing, Catalog and Samples on request. Burkhart Printing & Stationery Company, 115 South Cincinnati, Tulsa 3, Oklahoma.

WANTED

WANTED: OPERATOR to drill and finance well to depth of 4500 ft. in Williamson County, Texas. 8000 acres in one block. Tested with Magno-Electrograph. Correspond with Ed Ilse, Route 2, Georgetown, Tex.

ATTENTION OIL MEN: Will Supply $100,000 or more to any person who has something good in oil. A. F. Coffey, 1006 North Hamlin Avenue, Chicago 51, Illinois.

WANTED

Compressor Refinery Gas 0-140 psig. Would prefer Cooper-Bessemer GMV-4 or 8 with 24½" low stage and 15" high stage cylinders.

ASHLAND OIL & REFINING CO.
Ashland, Kentucky

ROYALTIES

DEEDED ROYALTIES
San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington, New Mexico.

ROYALTIES IN HOT AREAS!
Recent strikes have focused attention on Montana's deeper oil zones and major companies are moving fast, drilling and leasing. We buy direct in the field, sell direct to our customers. Write LANDOWNERS ROYALTIES COMPANY, Box 1225, Great Falls, Montana.

CASH MARKET for PRODUCING ROYALTIES
ROBERT L. KINKAID
World Bldg. Tulsa, Oklahoma

PRINCIPAL WILL BUY: Group of producing oil royalties and group of producing gas royalties, $5,000.00 to $50,000.00 worth. Send price and monthly income past twelve months to: Box C-949, The Oil and Gas Journal, Tulsa, Oklahoma.

PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorneys, Suite 418, 815-15th Street, N.W., Washington 5, D. C.

SERVICES

25 YEARS' experience buying Oil Leases, Royalties, in Texas, New Mexico, Louisiana, Arkansas, Mississippi. Title work. Services available, salary, commission. A-1 references. Joe L. Ferguson, 115 Wildwood Drive East, San Antonio, Texas.

EQUIPMENT MEN

(Continued from page 145)

special-analysis steels in which Crucible specializes. These are the stainless, alloy, and high-carbon grades of steels containing alloy elements to build in extra qualities of toughness, hardness, and resistance to heat, corrosion, and weathering.

Hemes Made Manager of Diaphragm Division

E. C. HEMES

Edward C. Hemes has been appointed manager of the diaphragm division of Vulcan Proofing Co., in charge of production and sales. During the past 3 years, Hemes has been promoting the sale of synthetic meter and regulator diaphragms in the midwestern states.

Prior to his affiliation with Vulcan Proofing Co., he was employed for 19 years by Milwaukee Gas Light Co. as superintendent of meters and assistant superintendent of the West Side plant where his experience included various phases of distribution as well as L.P.G. production.

He joined the Milwaukee company in 1927 immediately upon finishing his schooling at University of Wisconsin. J. K. Vetter has replaced Hemes as Vulcan's midwestern representative and will be located in Deerfield, Ill.

Globe Steel Announces Several Promotions

F. K. KRELL

J. F. SCOTT

Lee Mullen, vice president in charge of sales of Globe Steel Tubes Co., has announced several promotions and appointments. F. K. Krell has was appointed advertising manager in welding fittings. Krell joined the general sales staff of Globe in 1942, was appointed advertesing manager in 1944, and sales service supervisor in 1946. In 1947 he was appointed Chicago district sales representative which position he held until his recent promotion.

John F. Scott was promoted to manager of sales, stainless and alloy tubing. Scott came to Globe in 1940 serving as a metallurgist. He was later transferred to the general sales office as a chemical and metallurgical sales representative. Early in 1947 he was appointed sales representative for New York district and worked in this capacity before this promotion.

John Koss has been appointed sales representative, Chicago district. Koss joined the general sales staff of Globe in 1946. Previous to his appointment as sales representative he was in charge of export sales.

J. J. Lukens has been appointed sales representative, New York district. Lukens started in the laboratories of Globe in 1938. Prior to his promotion he was head of the pricing division.

R. H. Brooks Returns From Canadian Trip for Enardo

R. H. Brooks, Jr., sales manager for Enardo Manufacturing Co., of Tulsa, recently returned from an extended tour in Canada. Brooks made the trip in his company's behalf to introduce and familiarize Canadian production companies with the line of vapor-control tank equipment manufactured by Enardo.

Visiting the new fields around Calgary and Edmonton, Brooks gave informal talks to both management and field men while illustrating his company's equipment with over a hundred projection slides. During his 11 days in the Leduc and Redwater areas he talked to hundreds of workers now engaged in development of the new fields.

Brooks claimed that the Canadian field men were receptive and sincere. He also pointed out that the Canadians took both their conservation and safety programs very seriously, adhering closely to the rules of law and good judgment set down to save oil, machinery, and lives.

Scott Made Klipfel Valves' Assistant Sales Manager

The appointment of Grant E. Scott, Jr., as assistant sales manager has been announced by Klipfel Valves, Inc., a division of Hamilton-Thomas Corp., Hamilton, Ohio. Scott will serve as assistant to Frank Breor, sales manager of the division.

A graduate of Princeton University, Scott was previously associated with Wright Aeronautical Corp. and with Allis-Chalmers Manufacturing Co., as field and sales engineer.

Paddock to Make Eurasian Trip for Lucey and Totco

R. B. Paddock, service engineer for Technical Oil Tool Corp. and Lucey Export Corp., who nas recently returned from a 4-month trip through the oil fields of Trinidad, Venezuela, Colombia, and Mexico left in early July for an extended trip through Europe, the Middle East, and the Far East.

Paddock will continue his inspection and service of Totco and Lucey equipment in Europe and Asia.

LEGAL

ADDITIONAL TRIBAL INDIAN LANDS BEING ADVERTISED: Notice has been posted that 14,572.97 acres of additional Tribal Indian lands have been offered for sale, bids on which will be opened August 9, 1949, at 2:00 P.M., at the Uintah & Ouray Agency office, Fort Duchesne, Utah. The acreage being offered is located in Township 4 South, Ranges 4, 5, 6 and 7 West, USBM, State of Utah. Full particulars, with exact description of acreage may be obtained from the Uintah and Ouray Agency, Fort Duchesne, Utah., or the U. S. Geological Survey, Casper, Wyoming.

LEGAL

16,808.82 acres of Tribal Indian lands located in Township 1, North, Range 2, West; 1 North, 3 West; 1 South, 2 West; 1 South, 3 West; 1 South, 1 West; 1 South, 2 West; in the Uintah and Ouray Reservation Utah, are being advertised for lease, bids on which will be opened August 4, 1949, at 2:00 P.M., at the office of Forrest R. Stone, Superintendent of the Uintah and Ouray Indian Agency, Fort Duchesne, Utah. Full descriptions, and copies of advertisement may be obtained from Superintendent Stone or from Supervisor J. R. Schwabrow, U. S. Geological Survey, Federal Building, Casper, Wyo.

ADVERTISERS

Acme Fishing Tool Co. 130
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Allis-Chalmers 24
Aluminum Co. of America 91
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Axelson Manufacturing Company 98
B & W, Inc. 128
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Bethlehem Steel Co. 1
Bovaird Supply Co., The 74
Boyd Co., Clarence L. 94
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Wilson Oil Tools, Web 117
Youngstown Sheet & Tube Co. 49

Permian Basin

(Continued from page 136)

Sec. 1227, GC&SF Sur., 2 mi. W Noelke, dry, TD 1,503 ft. in shale.

Pecos County: C. U. Bay 1-C University, SE SE NW 20-16-University Lands, 2 mi. N Bakersfield, dry, TD 1,703 ft.

Hunt Oil Co. 8 Elsinore Royalty Co., 10-D-GC&SF, dry, TD 1,520 ft.

Upton County: Rutter & Wilbanks 1 Shirk, 17-3-MK&T, 1½ mi. NW McCamey field, dry, TD 2,466 ft.

SOUTHEASTERN NEW MEXICO

HOBBS.—Humble Oil & Refining Co. 1-X State, 31-11s-35e, was drilling ahead below 12,496 ft. in lime and shale. A 2-hour and 40-minute drill-stem test at 12,225-12,336 ft. recovered 3,360 ft. of water blanket and 14 ft. of drilling mud, with no shows. Flowing pressure was 1,530 psi. Shut-in pressure was not reported. Field sources identified the section tested as Mississippian.

Magnolia Petroleum Co. 1-B Santa Fe-Pacific, NE SE 28-9s-36e, Pennsylvanian prospect in Crossroads field, had total depth at 9,888 ft., and was running electrical surveys. A 2½-hour drill-stem test at 9,825-50 ft. recovered the 900-ft. water blanket plus 6,750 ft. of salt water. Flowing pressure ranged from 3,700-1,400 psi. Shut-in pressure was 3,700 psi. An earlier drill-stem test of the Pennsylvanian at 9,735-94 ft., open 3 hours and 40 minutes, produced gas in 15 minutes, estimated at 200,000 cu. ft. daily, and recovered 810 ft. of water blanket cut with mud and oil, and 6,500 ft. of 46°-gravity oil.

SOUTHEAST NEW MEXICO SUCCESSFUL WILDCAT

Lea County: Southern Union Gas Co. 1 State, 2-21s-37e, approximately 3 mi. N of Brunson Ellenburger field, flowed 268 bbl. 34°-grav. oil a day, Drinkard sand 6,681-6,736 ft., TP 200 psi., TD 6,810 ft., PB 6,775 ft., 1¾ mi. NE extension to Drinkard field.

SOUTHEAST NEW MEXICO WILDCAT FAILURES

Chaves County: Charles H. Osmond 1-A Levick-State, NE NE 32-12s-30e, dry, TD 3,200 ft., Yates 1,260 ft., San Andres 2,592 ft., elev. 3,879 ft.

Lea County: Ralph Lowe 1 Frank Selman, approximately SW SW 11-19s-38e, dry, TD 8,548 ft., Yates 2,850 ft., Glorietta 5,530 ft., Tubbs 6,600 ft., Devonian 8,050 ft., elev. 3,614 ft.

CALENDAR

August

United Nations Scientific Conference on the Conservation and Utilization of Resources, U. N. Interim Headquarters, Lake Success, N. Y., August 17-September 6.

September

Interstate Oil Compact Commission, summer quarterly meeting, Stanley Hotel, Estes Park, Colo., September 1-3.

Instrument Society of America, annual meeting and exhibit, Municipal Auditorium, St. Louis, September 12-16.

National Petroleum Association, Hotel Traymore, Atlantic City, N. J., September 14-16.

American Gas Association, annual convention, Chicago, September 17-20.

American Institute of Chemical Engineers, Mt. Royal Hotel, Montreal, September 18-20.

American Association of Oilwell Drilling Contractors, ninth annual meeting, Baker Hotel, Dallas, September 19-21.

National Butane-Propane Association, Jefferson Hotel, St. Louis, September 19-21.

Mid-Continent Oil and Gas Association, twenty-seventh annual convention, Louisiana-Arkansas division Roosevelt Hotel, New Orleans, September 22-23.

American Institute of Mining and Metallurgical Engineers, regional meeting, Neil House, Columbus, Ohio, September 25-28.

American Society of Mechanical Engineers, fall meeting, Erie, Pa., September 28-30.

October

American Society of Mechanical Engineers, petroleum division, 1949 Petroleum Mechanical Engineering Conference, Biltmore Hotel, Oklahoma City, October 2-5.

National Association of Corrosion Engineers, South-Central Regional Division, annual meeting, Adolphus Hotel, Dallas, October 3-4.

National Lubrication Grease Institute, Hotel Roosevelt, New Orleans, La., October 3-5.

American Institute of Mining & Metallurgical Engineers, Petroleum Branch, fall meeting, Plaza Hotel, San Antonio, October 5-7.

American Society for Testing Materials, first Pacific area national meeting, Hotel Fairmont, San Francisco, October 10.

Texas Mid-Continent Oil and Gas Association, annual meeting, Rice Hotel, Houston, October 13-14.

American Gas Association, annual convention, Chicago, October 17-20.

American Institute of Mining & Metallurgical Engineers, Petroleum Branch, fall meeting, Elk's Club, Los Angeles, October 20-21.

Independent Natural Gas Association of America, annual meeting, Baker Hotel, Dallas, October 31.

November

American Petroleum Institute, annual meeting, Stevens Hotel, Chicago, November 7-10.

American Society of Mechanical Engineers, annual meeting, Hotel Statler, New York, November 27-December 2.

December

American Institute of Chemical Engineers, annual meeting, William Penn Hotel, Pittsburgh, Pa., December 4-7.

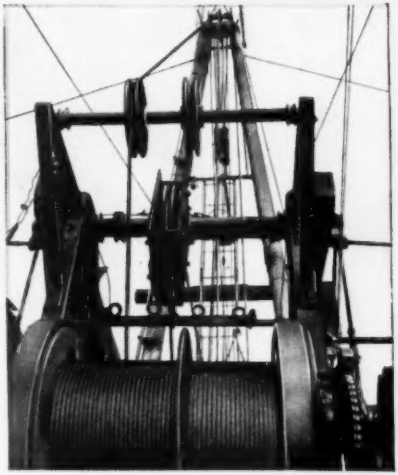
NOMADS

Houston Nomads, second Monday of each month, Ye Ole College Inn, Houston.

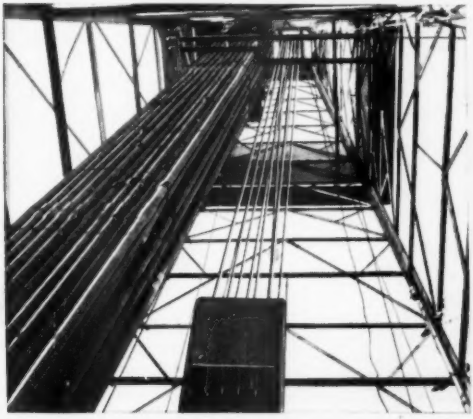
Los Angeles Nomads, second Wednesday each month, Jonathan Club.

Improved Performance with LAY-SET PREFORMED

There's a wire line that resists the whipping of sucker rod and tubing lines running at high speeds. It's LAY-SET Preformed. And how it stands up under shock loads when it is stopped suddenly! Yes, LAY-SET has been the favorite for years because it offers *improved performance.*



Cable tool drilling lines are jerked, whipped and snapped. Clean-out lines run at high speeds and rub against the casing much of the way down or up. These lines must be designed for the job or they won't last long. HAZARD has cable tool lines that are engineered for longer life. They cost less to use.



On the rotary drilling rig the driller calmly throws a lever. Up shoots the string of pipe. Suddenly it stops. The whole derrick shakes. A 100-ton strain, or more, may be placed on the line. It must be good . . . and LAY-SET Preformed rotary drilling lines are good. They can take it . . . and run up greater ton-mile records.

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